PCR mini-catalog

Premium enzymes & kits

that's GOOD science!™

TaKaRa Clontech

PCR / RT-PCR and Real Time PCR

Since its discovery by Kary Mullis, PCR has become the corner stone of molecular biology leading to developments in genetic research and diagnostic.

In 1988, Takara Bio became the first company in Japan to introduce a gene amplification system using the PCR method. In 1993, we obtained a license for the PCR method and began producing and marketing our own PCR-related products.

We have also developed our own original technologies, including the LA PCR (Long and Accurate PCR) enzymes *Ex Taq* and *LA Taq* to support the growing need of long genome fragment information. Such technology is out-licensed to other PCR-qPCR suppliers worldwide.

The next step was to design our currently available range of PCR/RT-PCR kits and enzymes to cover the entire specific needs in this ever growing area (High Fidelity, Real Time PCR, Hot Start, Premixes, Custom and bulk products, etc...).

About us

Takara Bio is a leading manufacturer and supplier of genetic engineering research reagents in Japan.

The highest level of quality of its products and services is acknowledged by the scientific community worldwide.

Takara's acquisition of Clontech in 2005 is one of many steps the company is taking to continue to provide innovative tools that allow customers to access technological advancements in the life sciences.

We particularly focus our development on genetic engineering, which is Takara's main area of expertise, and our core research operation is positioned as a technological platform for the development of other areas.

You want to amplify a target	with High Yield				with High Fidelity	
Your appplication is	Mammalian Genotyping, Multiplexing	Library Construction	Direct PCR	Low Copy Number and/or Dirty Samples	Long PCR, sequencing, cloning	Cloning and expression, DNA sequencing
Takara Clontech recommends	Titanium Taq	Advantage 2	Terra PCR Direct Polymerase Mix	TaKaRa Ex Taq DNA Polymerase	PrimeSTAR GXL	PrimeSTAR Max
For :	Sensitive and robust	Long PCR and enhanced fidelity	Genotyping without DNA purification	Higher fidelity and yield	Excellent all-around performance on a variety of templates	Highest fidelity
Amplicon size						
gDNA	<2 kb	<6 kb	<2 kb	<20 kb	<30 kb	<6 kb
Plasmid/lambda	<2 kb	<18.5 kb	NA	<30 kb	<40 kb	<15 kb
cDNA	<4 kb	<8.5 kb	NA	NA	<13.5 kb	<10 kb
Enzyme properties						
5'–3' exonuclease activity				Yes		
3'–5' exonuclease activity		Yes		Yes	Yes	Yes
T/A overhangs or Blunt	T/A	T/A	T/A	T/A	Blunt	Blunt
Format/ Important Features						
	PCR Kit with control template and primers available EcoDry premix available	PCR Kit with control template and primers available EcoDry premix available	2X premix w/ dye and various kits available GC content Up to 70%	Premix Available	Fidelity: 6.5X Taq (GC-rich target) Speed: 10 sec/kb (rapid protocol) GC content Up to 73%	Fidelity: 29X Taq (GC-rich target) Speed: 5 sec/kb 2X premix
Hot Start	Yes	Yes	Yes	Available	Yes	Yes
See page:	p.33	p.34	p.38, 39	p.30, 31	p.26, 27	p.27

You want to amplify a target	by Long-Range PCR			that is GC-Rich		
Your appplication is	Long PCR, sequencing, cloning	Long PCR, GC-rich, cloning, sequencing	Long PCR, sequencing, cloning	Robust genotyping	Long PCR, sequencing, cloning	Amplification prior to NGS without AT/GC bias
Takara Clontech recommends	TaKaRa LA Taq DNA Polymerase	TaKaRa LA Taq DNA Polymerase with GC Buffers	PrimeSTAR GXL	Advantage GC 2 Polymerase Mix	TaKaRa LA Taq DNA Polymerase with GC Buffers	PrimeSTAR GXL
For :	Maximum length	High fidelity	Excellent all-around performance on a variety of templates	High % GC	Long PCR with GC-rich templates	Highest fidelity
Amplicon size						
gDNA	<30 kb	<17.5 kb	<30 kb	<3.5 kb	<17.5 kb	<30 kb
Plasmid/lambda	<48 kb	<35 kb	<40 kb	<6 kb	<35 kb	<40 kb
cDNA			<13.5 kb	<2 kb	NA	<13.5 kb
Enzyme properties						
5'–3' exonuclease activity	Yes	Yes			Yes	
3'–5' exonuclease activity	Yes	Yes	Yes	Yes	Yes	Yes
T/A overhangs or Blunt	T/A	T/A	Blunt	T/A	T/A	Blunt
Format/ Important Features						
	Fidelity: 6.5X Taq (Standard %GC target)	Fidelity: 6.5X Taq (Standard %GC target)	Fidelity: 6.5X Taq (GC-rich target)	Fidelity: 3X Taq (Standard %GC target)	Fidelity: 6.5X Taq (Standard %GC target)	Fidelity: 6.5X Taq (GC-rich target)
	Speed: 60 sec/kb	Speed: 60 sec/kb	Speed: 10 sec/kb (rapid protocol)	Speed: 60 sec/kb	Speed: 60 sec/kb	Speed: 10 sec/kb (rapid protocol)
	GC content Up to 67%	GC content Up to 74%	GC content Up to 73%	GC content Up to 90%	GC content Up to 74%	GC content Up to 73%
	PCR Kit with control template and primers available			PCR Kit with control template and primers available	PCR Kit with control template and primers available	
Hot Start	Available		Yes			Yes
See page:	p.35, 36	p.35	p.26, 27	p.34	p.35	p.26, 27

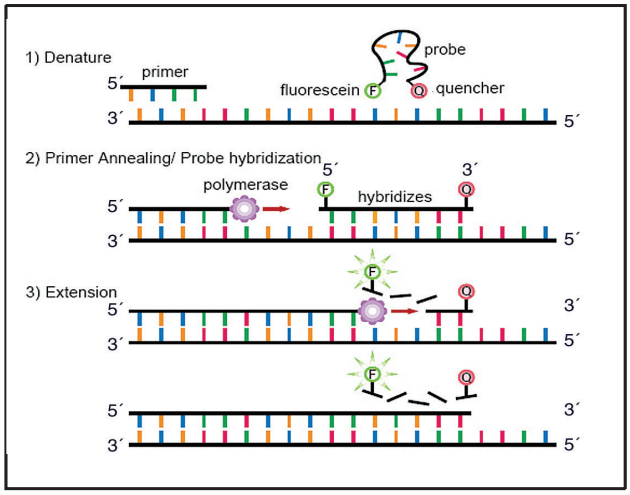
You want to amplify a target	in Fast PCR			for General Purpose		
Your appplication is	Cloning, sequencing	Colony PCR	High throughput	General applica-tions, multiplexing	Genotyping	High yield genotyping
Takara Clontech recommends	PrimeSTAR Max	SapphireAmp Fast PCR Master Mix	SpeedSTAR HS DNA Polymerase	TaKaRa Taq DNA Polymerase	EmeraldAmp GT PCR Master Mix	EmeraldAmp MAX PCR Master Mix
For :	Fast, convenient, and highest fidelity	Fast routine PCR	Fast with high efficiency PCR	Routine use	Value choice	Streamlined workflow
Amplicon size						
gDNA	<6 kb	<6 kb	<20 kb	<3 kb	<4 kb	<15 kb
Plasmid/lambda	<15 kb	<5 kb	<20 kb	<12 kb	NA	NA
cDNA	<6 kb	NA	NA	NA	NA	NA
Enzyme properties						
5'–3' exonuclease activity		Yes	Yes	Yes	Yes	Yes(weak)
3'–5' exonuclease activity	Yes	Yes	Yes			Yes
T/A overhangs or Blunt	Blunt	T/A	T/A	T/A	T/A	T/A
Format/ Important Features						
	5 sec/kb Fidelity: 29X Taq (GC-rich target) Speed: 5 sec/kb 2X premix	10 sec/kb Speed: 10 sec/kb 2X premix w/ dye	10 sec/kb Fidelity: 3-4 X Taq (GC-rich target) Speed: 10 sec/kb	Premix Available	2X premix w/ dye	2X premix w/ dye
Hot Start	Yes	Yes	Yes	Available		Available
See page:	p.27	p.37	p.37	p.40	p.41	p.32

You want to:	Clone your cDNA							
Experiment	cDNA synthesis				RT-PCR			
Type of kit	Stand alone RTase	Complete cDNA synthesis kit			Two-step RT-PCR		One-step RT-PCR	
Features *(Cat.No)*	ss cDNA Basic *(2680A, 2690A)*	ss cDNA Complete *(6110A , 6210A)*	Lyophilized master-mix with primers Eco Dry	ds cDNA Complete *(6111A)*	High Fidelity *(R022A)*	High Efficiency *(RR014A)*	High Efficiency Convenient *(RR055A)*	High Efficiency Convenient Plus Loading Dye *(RR057A)*
Major components	PrimeScript RTase	PrimeScript RTase + RNase inhibitor	Lyophilized SMART MMLV RTase + Primers	PrimeScript RTase + RNase inhibitor + 2nd Strand synthesis enzymes	PrimeScript RTase + RNase inhibitor + PrimeSTAR Max	PrimeScript RTase + RNase inhibitor + ExTaq HS polymerase	PrimeScript One Step enzyme mix (includes ExTaq HS & RNase inhibitor)	
Primers supplied	None	Oligo-dT & Random 6-mers	Oligo-dT and/or Random 6-mers	Oligo-dT & Random 6-mers	Oligo-dT & Random 6-mers		Gene Specific Primers (GSP) to be supplied by user	
Additionnal reagents required	Cloning solution, PCR enzymes				In-Fusion, PCR Cloning kit			
See page	p.22	p.22	p.23	p.23	p.24	p.24	p.25	p.25

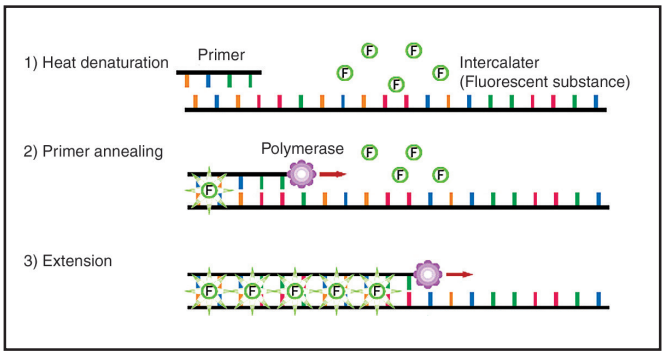
You want to:	Detect and quantify your target RNA				
Experiment	RT-qPCR				
Type of kit	Two-step RT-qPCR			One step RT-qPCR	
Features *(Cat.No)*	Seperate components *(RR037A)*	5X Premix with all components *(RR036A)*	Removes gDNA *(RR047A)*	TaqMan probe detection *(RR064A)*	SYBR detection *(RR066A, RR086A)*
Major components	PrimeScript RT enzyme mix + RNase inhibitor	PrimeScript RT Master Mix + RNase inhibitor	PrimeScript RT enzyme mix + gDNA Eraser + RNase inhibitor	PrimeScript RT enzyme mix + ExTaq HS polymerase + RNase inhibitor	
Primers supplied	Oligo-dT & Random 6-mers	Oligo-dT & Random 6-mers in an optimized mix		Gene Specific Primers (GSP) to be supplied by user	
Additionnal reagents required	SYBR or Probe Premix ExTaq (Tli RNase H+)				
See page:	p.16	p.16	p.16	p.15	p.12

Introduction to Real Time PCR (qPCR)

Real time PCR is a method for quantitative fluorescent detection of the initial amounts of DNA template in a sample.
Real time PCR (also called qPCR, for quantitative PCR) requires the use of a specialized thermocycler designed to detect the emissions of amplified fluorescently-labeled DNA molecules. This technique has been used for many diverse applications, including the detection of pathogenic bacteria, identification and quantitation of microorganisms from water samples, and detection of SNPs (single nucleotide polymorphisms) in genomic sequences, just to name a few.
Two common fluorescent-based DNA detection methods used for Real Time PCR include: 1) direct labeling of dsDNA by SYBR® Green I, or 2) probe detection method using the 5′ nuclease assay commonly referred to as the TaqMan® Probe Method (see figures below).



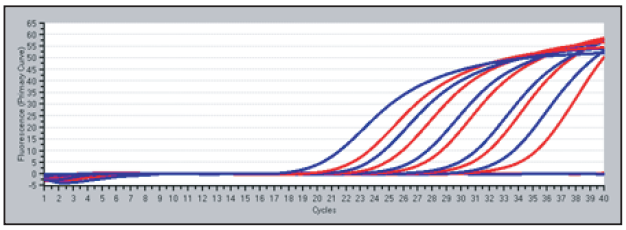
Probe Detection Method



SYBR® Green I Detection Method

Takara enhanced qPCR premixes with Tli RNase H

Thermostable Tli RNase H added in our qPCR Premixes addresses this inhibitory effect by digesting any residual RNA present in the qPCR reaction. This inhibition is seen particularly for GC-rich templates and poorly expressed genes. Tli RNase H added to the qPCR premix removes this inhibition without compromising the efficiency of the reaction, as shown in the figure below. Therefore these new premixes allow excellent quantification of any type of cDNA and thus offer unparalleled accuracy in gene expression studies.



Serial dilutions of cDNA synthesized with low RNase H RTase were subjected to amplification with SYBR premix, including Tli RNase H (blue line) or without RNase H treatment (red line). Target gene VGLL4 (GC content: 65%).
The clear shift to the left of the amplification curves obtained when using SYBR *Premix Ex Taq* II (Tli RNase H Plus) indicates better amplification efficiency (blue line). This results from the degradation of residual mRNA annealed to target DNA by the thermostable Tli RNase H, and thus removal of the observed inhibitory effect.

Guide to qPCR Polymerases

	Polymerase	Amplification Efficiency	Specificity	Convenience	High Speed	Long fragments	Hot-Start PCR	Guidelines for Length of Primers	Detection Method
Real Time PCR	*Premix Ex Taq*™ (Probe qPCR) *	++++	++++	++++	++++	+++	++++	17-25 bp	Probe and SYBR
	SYBR® *Premix Ex Taq*™ (Tli RNase H+)*	++++	+++	++++	++++	++++	++++	17-25 bp	SYBR
	SYBR® *Premix Ex Taq*™ II (Tli RNase H+)*	++++	++++	++++	++++	++	++++	17-25 bp	SYBR

* Sample Available

Comparison of Takara's Real Time PCR Kits

	SYBR® *Premix Ex Taq*™ (Tli RNase H +)	*Premix Ex Taq*™ (Probe qPCR)	SYBR® *Premix Ex Taq*™ II (Tli RNase H +)
Cat.#	**RR420A**	**RR390A**	**RR820A**
Reactions/Kit	200 (50 µL reaction size)	200 (50 µL reaction size)	200 (50 µL reaction size)
Premix or Separates	Premix	Premix	Premix
Reaction Volumes Smart Cycler® ABI LightCycler®	 25 µL 10, 25, 50 µL 20 µL	 25 µL 20, 50 µL 20 µL	 Not Applicable 10, 25, 50 µL 20 µL
Enzyme	*TaKaRa Ex Taq*™ Hot Start	*TaKaRa Ex Taq*™ Hot Start	*TaKaRa Ex Taq*™ Hot Start
Buffer	2X premix with optimized buffer (with Mg^{2+}) (Tli RNaseH) (note: buffer differs from RR390)	2X premix with optimized buffer (with Mg^{2+}) (note: buffer differs from RR420)	2X premix with optimized buffer (with Mg^{2+}) (note: buffer differs from RR420)
Detection Method	SYBR® Green I (supplied in premix)	SYBR® Green I or TaqMan® Probes (not supplied)	SYBR® Green I (supplied in premix)
Reference Dye	ROX & ROX II (as separate tubes)	ROX & ROX II (as separate tubes)	ROX & ROX II (as separate tubes)
Instruments Supported*	Applied Biosystems 7300/7700/7900 HT/7500 real time PCR system, StepOne Plus real time PCR system (Life Technologies) iCycler®, LightCycler®, Smart Cycler®, Mx3000P	Applied Biosystems 7300/7700/7900 HT/7500 real time PCR system, StepOne Plus real time PCR system (Life Technologies) LightCycler®, Smart Cycler®, Smart Cycler® II, iCycler®	Applied Biosystems 7300/7500 real time PCR system, StepOne Plus real time PCR system (Life Technologies) LightCycler®

Note: ROX reference dye is recommended for use with ABI PRISM® 7000/7700/7900 HT and Applied Biosystems 7300 real time instruments.
ROX II reference dye is recommended for use with the Applied Biosystems 7500 real time instrument.
*Other instruments may also be appropriate but have not been tested.

EASY Dilution Solution (for real time PCR)

Features

- Used to dilute DNA or RNA for standard curve this solution avoids nucleic acids to stick to tube walls: accurate quantification across the standard curve

External Standard Kit

Features

- **λ polyA+ RNA and primers:** allow to access efficiency of both RT and PCR step in RT-qPCR reaction.
- **λ-phage sequence:** normalize qPCR without interfering with pro- and eukaryotic templates

Kit Components

- Real Time Primers for λ polyA (10 µM) 200 µl each
- EASY Dilution (for Real Time PCR) 1 ml
- λ polyA+ RNA-A (10 ng/µl) 15 µl

Product Information

Product	Size	Cat.No
EASY Dilution Solution (for real time PCR)	8 x 1 ml	9160
External Standard Kit (Lambda PolyA) for qPCR	1 Set	3789

SYBR® Green I Detection§

SYBR® *Premix Ex Taq*™ (TIi RNase H Plus)

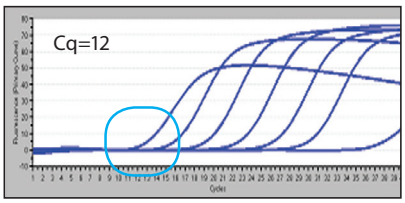
Features

- **RNase H included in reaction mix:** reduces inhibition from mRNA/cDNA hybrids
- **Eliminates need for RNase H digestion step:** when using low RNase H RTs
- **Amplification of longer fragments:** up to 570 bp fragments
- **High sensitivity:** detects as few as 100 copies
- **Accurate quantitation:** excellent standard curves for various real time instruments have been established
- Compatible with all qPCR instruments
- Convinient 4°C storage

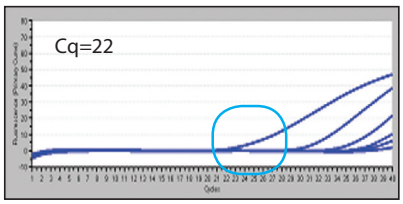
Kit Components

RR420A

• SYBR® *Premix Ex Taq*™ (TIi RNase H Plus) (2X conc.)*1	5 × 1 ml
• ROX Reference Dye (50X conc.)*2	200 µl
• ROX Reference Dye II (50X conc.)*2	200 µl



SYBR® *Premix Ex Taq*™ (TIi RNase H+)(Cat.# RR420)



Company A SYBR Master Mix

Target: ACTB (533 bp).
Results: Superior performance on long fragments and excellent Cq values when using SYBR® *Premix Ex Taq*™ (TIi RNase H+).

Greater results with longer amplicons: amplify targets up to ~533 bp

SYBR® *Premix Ex Taq*™ II (TIi RNase H Plus)

Features

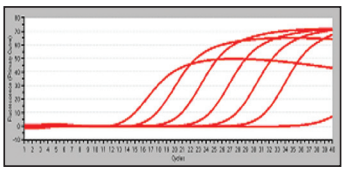
- **Optimized** for Real Time PCR with SYBR® Green I
- **Easy preparation**
- **Extremely high specificity:** optimized buffer and anti-Taq antibody mediated HS polymerase
- **Minimization of PCR inhibition:** due to residual mRNA by premixed TIi RNase H
- Compatible with most qPCR instruments*
- Convenient 4°C storage

Kit Components

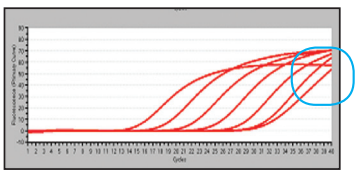
RR820A

• SYBR® *Premix Ex Taq*™ II (TIi RNaseH Plus) (2X conc.)*1	5 × 1 ml
• ROX Reference Dye (50X conc.)*2	200 µl
• ROX Reference Dye II (50X conc.)*2	200 µl

Note: We recommend using SYBR® *Premix Ex Taq*™ (TIi RNaseH Plus) (Cat.# RR420A) for Smart Cycler® System/Smart Cycler® II System (Cepheid).



SYBR® *Premix Ex Taq*™ II (TIi RNase H+)(Cat.# RR820)



Company A SYBR Master Mix

Superior specificity: limits primer dimers and off-target amplification

Target: ACTB (186 bp)
Results: Superior specificity, maintains signal below baseline in no template control reactions.

Notes:

*1 Contains *TaKaRa Ex Taq*™HS, dNTP Mixture, Mg^{2+}, TIi RNaseH and SYBR® Green I.

*2 This component is to be used for analyses using a device that corrects fluorescent signals between wells, such as the real-time PCR device by Applied Biosystems.
Please use ROX Reference Dye for Applied Biosystems 7900HT/7300 Real-Time PCR System or StepOnePlus™ and ROX Reference Dye II for 7500 Real-Time PCR System or 7500 Fast Real-Time PCR System.
ROX Reference Dye II is compatible with Agilent Mx3000P™. This component is not required with Thermal Cycler Dice™ Real Time System II, Smart Cycler® System or LightCycler®.

§ TAKARA BIO is under a license agreement with Molecular Probes Inc. for the use of SYBR® Green I as a reagent for research purposes. SYBR® is a registered trademark of Molecular Probes Inc.

SYBR® Green I Detection§ (continued)

One-Step SYBR® PrimeScript™ RT-PCR Kit

Features

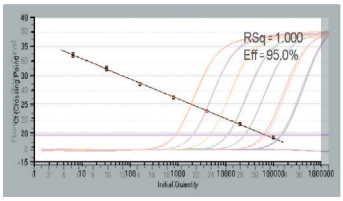
- **Easy:** One-Step RT-PCR lowers pipeting and contamination risks
- **Efficient and sensitive:** uses PrimeScript™ RTase, a robust reverse transcriptase. Also includes *Ex Taq*™ HS, a high efficiency hot start PCR enzyme to detect small amount of RNA
- **Optimized** for One-Step RT-qPCR with SYBR Green I detection

Kit Components

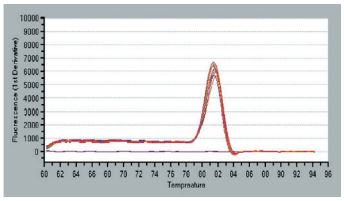
RR066A

• 2X One-Step SYBR® RT-PCR Buffer III*	3 × 840 µl
• *TaKaRa Ex Taq*™ HS (5U /µl)	100 µl
• PrimeScript™ RT Enzyme Mix II**	100 µl
• RNase Free dH_2O	2 × 1.25 ml
• ROX Reference Dye (50X conc.[1])	100 µl
• ROX Reference Dye II (50X conc.[1])	100 µl

*** Includes dNTP Mixture, Mg^{2+} and SYBR® Green I**
**** Includes RNase Inhibitor and RTase**



Standard curve
(amplification in background)



Melting curve

Detection of Rat Rplp2 (ribosomal protein, large, P2) mRNA from total RNA
Template: Rat liver total RNA 6.4 pg - 100 ng (negative control is dH_2O)
Primers: Specific primers supplied through custom service (Perfect Real Time Support System, only available in Japan)

Performance of real-time One-Step RT-PCR with SYBR® Green I detection

One-Step SYBR® PrimeScript™ RT-PCR Kit II

Features

- **Extremely high specificity:** optimized buffer and anti-Taq antibody mediated HS polymerase
- **Easy and efficient:** premixed components lower pipeting and contamination risks in One-Step RT-PCR
- **Sensitive:** accurate quantification of any RNA inclucing RNA viruses or small amounts of RNA

Kit Components

RR086A

• 2X One-Step SYBR® RT-PCR Buffer IV*	3 x 840 µl
• PrimeScript™ 1 step enzyme Mix II**	200 µl
• RNase Free dH_2O	2 x 1.25 ml
• ROX Reference Dye (50X conc.[1])	100 µl
• ROX Reference Dye II (50X conc.[1])	100 µl

*** Includes dNTP Mixture, Mg^{2+} and SYBR® Green I**
**** Includes PrimeScript™ RTase, RNase Inhibitor, *TaKaRa Ex* ™ HS**

Product Information

Cat.No	Product	Size
RR420A/B	SYBR® *Premix Ex Taq*™ (Tli RNase H Plus)	200/2x200 Rxns (50 µl)
RR420L/W	SYBR® *Premix Ex Taq*™ (Tli RNase H Plus) 5ml	200/5x200 Rxn (50 µl)
RR420LR/WR	SYBR® *Premix Ex Taq*™ ROX+ (Tli RNase H Plus) 5ml	200/5x200 Rxn (50 µl)
RR820A/B	SYBR® *Premix Ex Taq*™ II (Tli RNase H Plus)	200/2x200 Rxns (50 µl)
RR820L/W	SYBR® *Premix Ex Taq*™ II (Tli RNase H Plus)	200/5x200 Rxn (50 µl)
RR820LR/WR	SYBR® *Premix Ex Taq*™ II ROX+ (Tli RNase H Plus)	200/5x200 Rxn (50 µl)
RR066A/B	One-Step SYBR® PrimeScript™ qRT-PCR Kit	100/5x100 Rxns (50 µl)
RR086A/B	One-Step SYBR® PrimeScript™ qRT-PCR Kit II	100/5x100 Rxns (50 µl)

Notes:
[1] ROX™ Reference Dye/Dye II is used for normalization of fluorescence intensity by background subtraction. For ABI PRISM® 7000/7700/7900HT and Applied Biosystems 7300 Real-Time PCR System, the use of ROX™ Reference Dye (50X) is recommended. For Applied Biosystems 7500 Real-Time PCR System, the use of ROX™ Reference Dye II is recommended.
The use of ROX™ Reference Dye or Dye II is optional. It is not required for use with Thermal Cycler Dice™ Real Time System, Smart Cycler® or LightCycler® real time instruments.
§ TAKARA BIO is under a license agreement with Molecular Probes Inc. for the use of SYBR® Green I as a reagent for research purposes. SYBR® is a registered trademark of Molecular Probes Inc.

SYBR® Green I Detection§ (continued)

SYBR® Advantage® GC qPCR Premix

Features

- Convenient 2X premix format containing SYBR Green dye
- Optimized for GC- rich target quantification
- Fast and sensitive qPCR
- Compatible with all real-time PCR instruments: 2 tubes of ROX reference dye supplied

Kit Components

638320

• 2X SYBR® Advantage® GC qPCR Premix *	5 x 1 ml
• ROX Reference Dye LSR (50X)	200 µl
• ROX Reference Dye LMP (50X)	200 µl

***Containing SYBR Green I dye, full-length *Taq* DNA Polymerase, hot-start antibody, dNTPs, and buffer (including Mg^{2+}).**

Terra™ qPCR Direct SYBR® Premix

Features

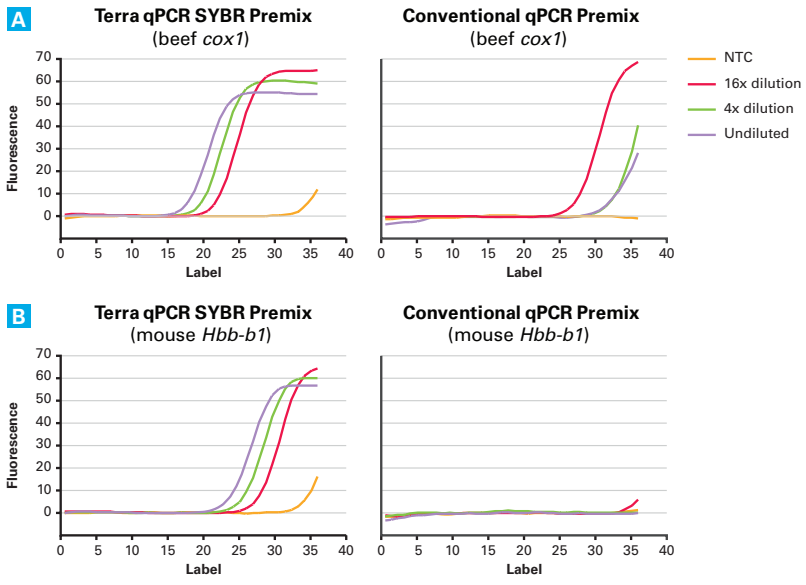
- **Based on Terra direct polymerase:** novel *Taq* selected for its ability to amplify DNA from crude/dirty samples
- **Save time and money:** no template purification necessary
- Easily amplify GC-rich targets
- Convenient 2X master mix contains SYBR® Green I dye
- Automatic hot start
- Perfect for high-throughput screening applications
- Compatible with all real-time PCR instruments: 2 tubes of ROX reference dye supplied

Kit Components

638319

• 2X Terra qPCR Direct SYBR® Premix *	5 x 1 ml
• ROX Reference Dye LSR (50X)	200 µl
• ROX Reference Dye LMP (50X)	200 µl

***Containing SYBR® Green I dye, Terra Direct Polymerase, hot-start antibody, dNTPs, and buffer.**



Terra qPCR Direct SYBR® Premix allows DNA quantification from crude samples.
Real-time PCR with crude extracts—Terra qPCR Direct SYBR® Premix versus a conventional 2X qPCR premix. Real-time PCR was performed using undiluted, 4X diluted, and 16X diluted crude alkaline-heat extracts of mouse spleen or cow muscle (beef foodstuff), and either Terra qPCR Direct SYBR® Premix or a conventional qPCR premix. Using the manufacturer's recommended conditions for each enzyme mix, a 165 bp region of the beta-globin gene Hbb-b1 was amplified from the mouse spleen extract (Panel A), and a 289 bp region of the cytochrome c oxidase gene (COX1) was amplified from the beef extract (Panel B). Data generated by Terra qPCR Direct SYBR® Premix corresponded to the theoretical quantities of each gene, while the conventional product was clearly affected by inhibitors present in the crude samples.

Product Information

Cat.No	Product	Size
638320	SYBR® Advantage® GC qPCR Premix	200 Rxns (50 µl)
638322	SYBR® Advantage® GC qPCR Premix	40 Rxns (50 µl)
638318	Terra™ qPCR Direct SYBR® Premix	400 Rxns (50 µl)
638319	Terra™ qPCR Direct SYBR® Premix	200 Rxns (50 µl)
638323	Terra™ qPCR Direct SYBR® Premix	40 Rxns (50 µl)

Probe Detection

Premix Ex Taq™ (Probe qPCR)

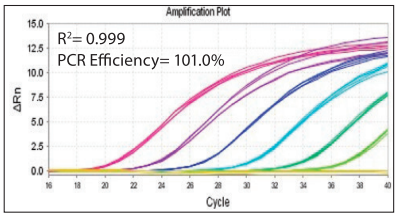
Features

- **Rapid, accurate and quantitative gene expression analysis:** using real-time PCR and TaqMan® probe detection
- **2X Premix:** makes pipetting easy
- **Excellent amplification efficiency and highly sensitive detection:** from the optimized buffer and use of *Ex Taq* HS polymerase
- **Includes Tli RNaseH, a heat-resistant RNaseH:** to minimize PCR inhibition by residual mRNA in reactions using a cDNA template
- Compatible with all qPCR instruments: ROX reference dye included
- Convenient 4°C storage

Kit Components

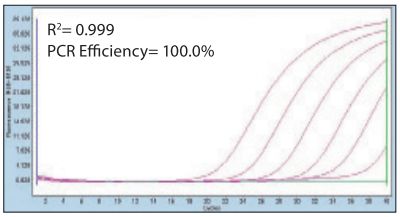
RR390A

• *Premix Ex Taq*™ (Probe qPCR) (2X conc.)*1	5 x 1 ml
• ROX Reference Dye (50X conc.)*2	200 µl
• ROX Reference Dye II (50X conc.)*2	200 µl



Roche LightCycler® 480

Template: Mouse liver cDNA (equivalent total RNA 1 pg ~ 100 ng)
Target: Ywhae (using TaqMan Gene Expression Assays)



Applied Biosystems StepOnePlus™

Excellent quantification is obtained with *Premix Ex Taq*™ (Probe qPCR) on StepOnePlus™ (Applied Biosystems) and LightCycler 480 (Roche) instruments

Premix Ex Taq™ (Perfect Real Time)

Features

- **High specificity:** includes optimized buffer and *Ex Taq* HS for multiplex
- **High sensitivity:** detects as few as 10 target copies.
- **Wide dynamic range:** >6 log (see figure)
- **Accurate quantitation:** produces excellent standard curves with numerous real time instruments.
- Compatible with all qPCR instruments: ROX reference dye included
- Convenient 4°C storage

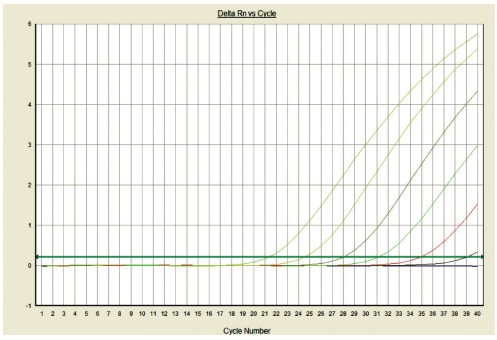
Kit Components

RR039A

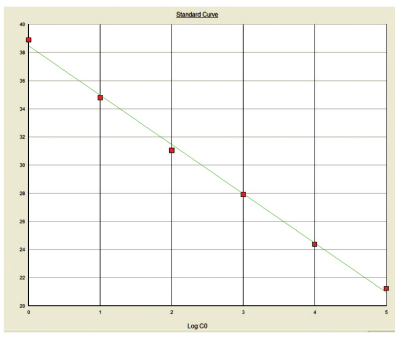
• *Premix Ex Taq*™ Mix (2X conc.)*3	5 x 1 ml
• ROX Reference Dye (50X conc.)*2	200 µl
• ROX Reference Dye II (50X conc.)*2	200 µl

***Contains *Ex Taq*™ HS DNA Polymerase, dNTP mix, Mg^{2+}**

Takara *Premix Ex Taq*™ (Perfect Real Time)



Amplification curve



Standard curve

Takara *Premix Ex Taq*™ (Perfect Real Time) PCR conditions:
95°C 10 sec. } 1 cycle
↓
95°C 5 sec. ┐
60°C 34 sec. ┘ **40 cycles**
(Approx. 50 min.)

Amplification curve (left panel) and standard curve (right panel) for *Premix Ex Taq*™ (Perfect Real Time) using the TaqMan® Gene Expression Assay on the Applied Biosystems 7500 Real-Time PCR System.

Notes: *1 Contains *TaKaRa Ex Taq*® HS, dNTP Mixture, Mg^{2+}, and Tli RNase H.
*2 Use when performing analyses with a device such as real-time PCR instruments by Life Technologies that normalize fluorescent signals between wells. Use ROX™ Reference Dye for ABI PRISM® 7000/7700, 7300 Real-Time PCR System, and StepOnePlus™ Real-Time PCR System. Use ROX™ Reference Dye II for 7500 Real-Time PCR System and 7500 Fast Real-Time PCR System. Use the ROX™ Reference Dye at a final concentration of 1X and the ROX™ Reference Dye II at a final concentration of 0.5X. No dye is required when using Thermal Cycler Dice™ Real Time System II, Smart Cycler® System, or LightCycler®.
*3 Contains Ex Taq™ HS DNA Polymerase, dNTP mix, Mg^{2+}

Probe Detection (continued)

One-Step PrimeScript™ RT-PCR Kit

Features

- **Easy:** One-Step RT-PCR lowers pipeting and contamination risks.
- **Robust and efficient:** PrimeScript™ (RNase H Minus MMLV-based) RTase ensures efficient transcription from any RNA template even with high secondary structure
- **Sensitive:** accurate quantification of any RNA with TaqMan® probe*1 detection

Kit Components

RR064A

• 2X One-Step RT-PCR Buffer III*	3 x 840 µl
• *TaKaRa Ex Taq*® HS 5U/µL	100 µl
• PrimeScript™ RT Enzyme Mix II**	100 µl
• RNase Free dH_2O	2 x 1.25 ml
• ROX Reference Dye*2 50X conc.	100 µl
• ROX Reference Dye II*2 50X conc.	100 µl

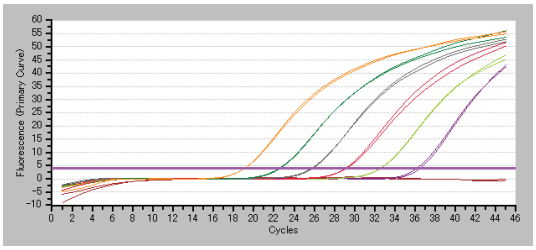
*** Includes dNTP Mixture and Mg**
**** Includes RNase Inhibitor and RTase**

Detection of mouse Actb

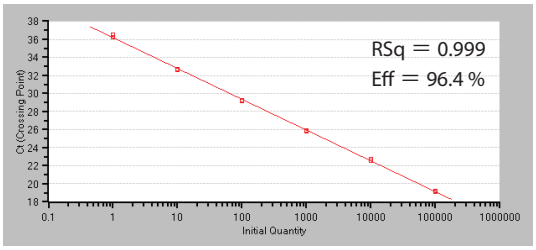
Using total RNA 1 pg - 100 ng that was prepared from mouse liver and sterilized water (negative control) as an template, Real-Time One Step RT- PCR was performed with Thermal Cycler Dice Real Time System. PCR products were detected with the Primer of TaqMan® Gene Expression Assays and TaqMan® Probe (Life Technologies).

Target cDNA was detected using total RNA range 1 pg - 100 ng. and delivers a linear standard curve within this wide range of template.

< Crossing point method >

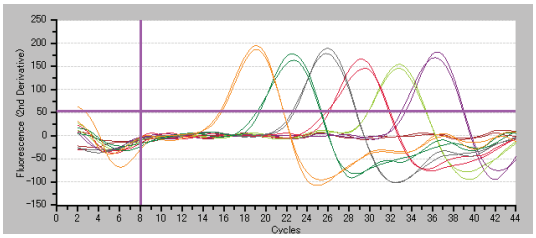


Amplification curve

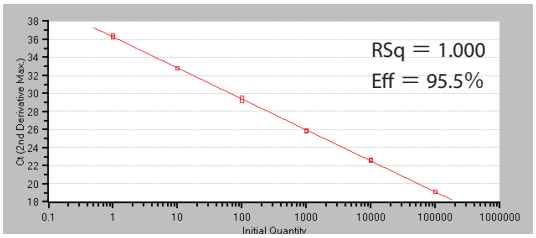


Standard curve

< 2nd derivative maximum method >



Amplification curve



Standard curve

Product Information

Cat.No	Product	Size
RR390A/B	*Premix Ex Taq*™ (Probe qPCR)	200/2x200 Rxns (50 µl)
RR390L/W	*Premix Ex Taq*™ (Probe qPCR)	200/5x200 Rxn (50 µl)
RR390LR/WR	*Premix Ex Taq*™ (Probe qPCR), ROX Plus	200/5x200 Rxn (50 µl)
RR039A/B	*Premix Ex Taq*™ DNA Polymerase (Perfect Real Time)	200/2x200 Rxns (50 µl)
RR039W	*Premix Ex Taq*™ DNA Polymerase (Perfect Real Time), 25 mL	5x200 Rxns (50 µl)
RR064A/B	One Step PrimeScript™ RT-PCR Kit (Perfect Real Time)	100/5x100 Rxns (50 µl)

Notes:
*1 Use One-Step SYBR® PrimeScript™ RT-PCR Kit (Perfect Real Time) for real time one-step RT-PCR using SYBR® Green I for detection.
*2 ROX™ Reference Dye/Dye II is used for normalization of intensity by background subtraction. For ABI PRISM® 7000/7700/7900HT and Applied Biosystems 7300 Real-Time PCR System, the use of ROX™ Reference Dye (50X) is recommended. For Applied Biosystems 7500 Real-Time PCR System, the use of ROX™ Reference Dye II is recommended. The use of ROX™ Reference Dye or Dye II is optional. It is not required for use with Thermal Cycler Dice® Real Time System, Smart Cycler® or LightCycler® real time instruments.

Two-Step RT-qPCR

PrimeScript™ RT Reagent Kit

Features

- **Fast cDNA synthesis:** ready for qPCR in 15 minutes
- **Efficient synthesis:** uses PrimeScript RTase to reverse-transcribe any RNA, even RNA with strong secondary structure. This kit is best suited for two-step RT-qPCR
- **Includes random 6 mers and Oligo dT primer** for use as reverse transcription primers

Kit Components

RR037A

• 5X PrimeScript™ Buffer (for Real Time)*	400 µl
• PrimeScript™ RT Enzyme Mix I	100 µl
• Oligo dT Primer 50 µM	100 µl
• Random 6 mers 100 µM	100 µl
• RNase Free dH_2O	1 ml
• EASY Dilution (for Real Time PCR)§	1 ml

*** Contains dNTP Mixture and Mg^{2+}**

PrimeScript™ RT Master Mix

Features

- **Fast cDNA synthesis:** ready for qPCR in 15 minutes
- **Efficient synthesis:** uses PrimeScript RTase to reverse-transcribe any RNA, even RNA with strong secondary structure. This kit is best suited for two-step RT-qPCR
- **Random 6 mers and Oligo dT primer** in the premix for full RNA coverage
- **Simple to use and suitable for high through-put:** Master Mix reduces pipetting steps and contamination risks

Kit Components

RR036A

• 5X PrimeScript™ RT Master Mix (Perfect Real Time)*	400 µl
• RNase Free dH_2O	2 x 1 ml
• EASY Dilution (for Real Time PCR)§	1 ml

*** Contains PrimeScript™ RTase, RNase Inhibitor, Oligo dT Primer, Random 6mers, dNTP Mixture, and reaction buffer (containing Mg^{2+}).**

PrimeScript™ RT Reagent Kit with gDNA Eraser

Features

- **Accurate gene expression analysis:** eliminate genomic DNA in just 2 minutes; avoids gDNA quantification
- **2-step RT-qPCR:** first-strand cDNA synthesis to be used for real-time PCR (qPCR)
- **Fast:** reverse transcription is complete in just 15 minutes
- **Random 6 mers and Oligo dT primer** in the Primer Mix for full RNA coverage

Kit Components

RR047A

• gDNA Eraser	100 µl
• 5X gDNA Eraser Buffer*1	200 µl
• PrimeScript™ RT Enzyme Mix I*2	200 µl
• 5X PrimeScript™ Buffer 2 (for Real Time)*3	400 µl
• RT Primer Mix*4	400 µl
• RNase Free dH_2O	2 x 1 ml
• EASY Dilution (for Real Time PCR)§	1 ml

***1: Because 5X gDNA Eraser Buffer is needed for the subsequent reverse-transcription reaction, please be sure to perform the genomic DNA elimination reaction.**
***2: Contains RNase inhibitor and RTase.**
***3: Contains dNTP mixture.**
***4: Contains Oligo dT Primer and Random 6 mers.**

Product Information

Cat.No	Product	Size
RR037A/B	PrimeScript™ RT Reagent Kit (Perfect Real Time)	200/4x200 Rxns (10 µl)
RR036A/B	PrimeScript™ RT Master Mix (Perfect Real Time)	200/4x200 Rxns (10 µl)
RR047A/B	PrimeScript™ RT Reagent Kit with gDNA Eraser (Perfect Real Time)	100/4x100 Rxns (20 µl)

Notes:
§This solution can be used to prepare the dilution series of total RNA or cDNA for establishing a standard curve. In contrast to dilution with water or TE, EASY Dilution facilitates accurate low concentration dilution. The Easy Dilution does not inhibit either reverse transcription or PCR enzyme activity. The diluted template solutions can be used as the templates for reverse transcription or PCR reactions. EASY Dilution is also available separately (Cat.# 9160).

RNA & cDNA references

qPCR Human Reference Total RNA

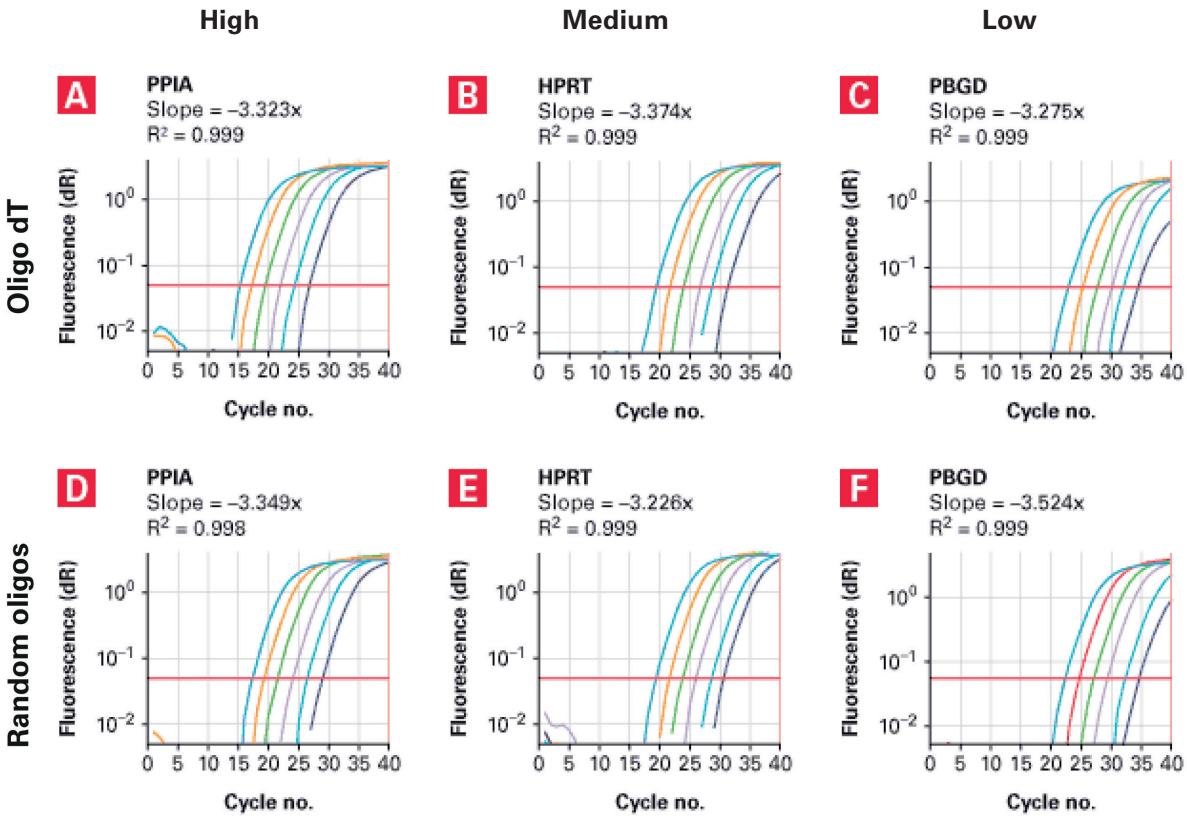
Features

- **Broadest possible gene representation:** made by pooling the total RNA extracts from whole human tissues
- **Minimal lot-to-lot variation:** RNA mixes prepared on an industrial scale
- Less gene-to-gene signal variation
- Virtually free of genomic DNA

qPCR Human Reference cDNA

Features

- **Broad gene coverage:** more accurate standardization than what is obtained with Housekeeping genes
- **Made from human tissues, not cultured cell lines:** better gene representation with less variation
- A high-performance standard for quantitative PCR
- Virtually free of genomic DNA



High-, medium- and low-abundance gene targets are easily detected in qPCR Human Reference cDNA. Oligo dT-primed (Panels A–C) and random oligo-primed (Panels D–F) qPCR Human Reference cDNA samples were each serially diluted fivefold such that the final quantities of cDNA template in the qPCR reactions were 20 ng, 4 ng, 800 pg, 160 pg, 32 pg and 6.4 pg. Data were obtained on a Stratagene Mx3000P real-time PCR instrument. The primer sets for all three genes demonstrate the ability to detect a wide range of signals from the serially diluted samples. PPIA = peptidylprolyl isomerase A (cyclophilin A; high-abundance); HPRT = hypoxanthine phosphoribosyltransferase I (medium-abundance); PBGD = porphobilinogen deaminase (low-abundance). Slope and R2 values refer to the line determinedby plotting Ct values versus template quantity.

Product Information

Cat.No	Product	Size
636690	qPCR Human Reference Total RNA	25 µg
636692	qPCR Human Reference cDNA, Oligo(dT)-primed	25 Rxns
636693	qPCR Human Reference cDNA, Oligo(dT)-primed	100 Rxns
639653	qPCR Human Reference cDNA, Random-primed	25 Rxns
639654	qPCR Human Reference cDNA, Random-primed	100 Rxns

Sample preparation for RT-qPCR

CellAmp™ Direct RNA Prep Kit for RT-qPCR

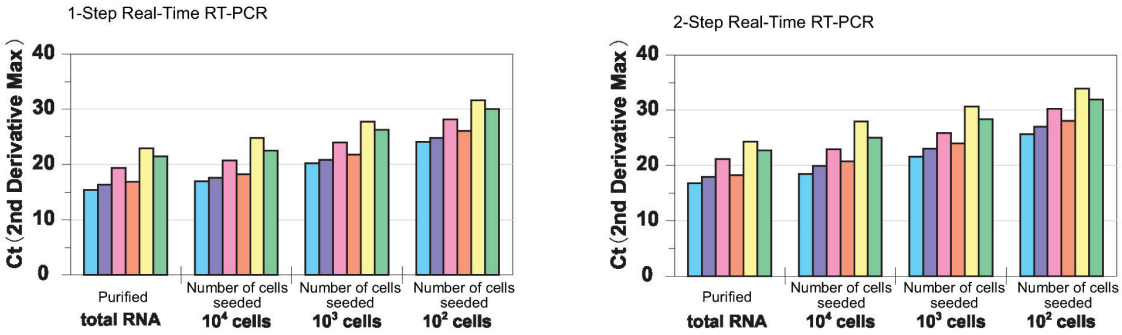
Features

- **Fast and simple:** obtain the RNA template for RT-qPCR in a single tube in 10 minutes from 96 well culture plates
- **Direct preparation of RNA:** avoids loss of material during purification steps. Excellent for detection of rare transcripts
- **Rapid gene expression analysis:** 2 hours including RNA extraction and One-Step RT-qPCR reaction
- **RNA template can be used for One-Step or Two-Step RT-qPCR**

Kit Components

3732

• CellAmp™ Washing Buffer	2 x 12.5 ml
• CellAmp™ Processing Buffer	10 ml
• DNase I for Direct RNA Prep	200 µl



Reagents

For 1-step : One Step SYBR® PrimeScript® RT-PCR Kit II (Perfect Real Time)

For 2-step : PrimeScript® RT reagent Kit (Perfect Real Time) and SYBR® Premix DimerEraser™ (Perfect Real Time)

Apparatus : Thermal Cycler Dice® Real Time System

Target : RPLP1, RPLP2, HPRT1, B2M, TBP, GUSB

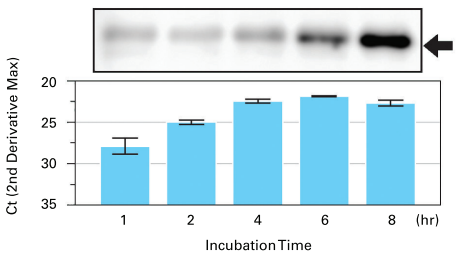
Primer : Primer for Perfect Real Time Support System

Analytical Results on Expressions by 6 Different Genes. For all lysate samples, regardless of the number of cells from which they were prepared, both the 1-step and 2-step real-time RT-PCRs provided stable gene expression profiles similar to that obtained using the high-purity RNA sample prepared with the FastPure® RNA Kit.

CellAmp™ Direct RNA Prep Kit for Real Time PCR and Protein Analysis

Features

- **Perform Western Blot Analysis and RT-qPCR on the same sample:** loading buffer supplied for SDS-Page
- Same features as above kit for fast RNA template preparation



A comparison of results between Western Blot Analysis and mRNA Expression

Result of Western blot analysis (top)
Result of real-time RT-PCR (bottom)

Kit Components

3733

• CellAmp™ Washing Buffer	2 x 12.5 ml
• CellAmp™ Processing Buffer	10 ml
• DNase I for Direct RNA Prep	200 µl
• 5X Loading Buffer	2 x 1 ml
• 1M DTT (Dithiothreitol)	2 x 100 µl

For 200 wells of cultured cells in 96-well plates.

Sample preparation for RT-qPCR (continued)

CellAmp™ Whole Transcriptome Amplification Kit (Real Time), Ver. 2

Features

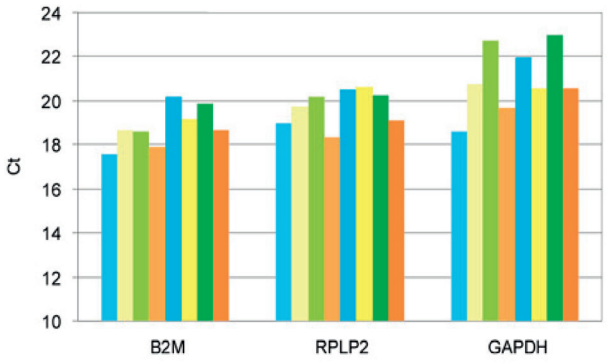
- Allows direct amplification of cDNA from a small number of cultured cells (1-1,000)
- Obtained cDNA allows analysis of multiple genes from small samples by qPCR
- Increased amplification yield for genes with low expression levels

Kit Components

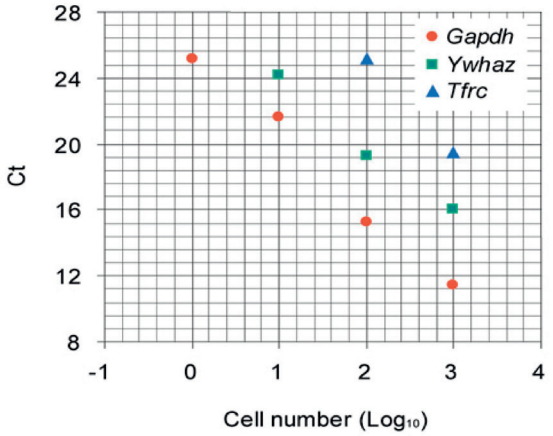
3734

• Lysis Buffer (4×)	150 µl
• Recombinant RNase Inhibitor (40 U/µl)	30 µl
• RT dT Primer 2	12 µl
• dNTP Mixture (2.5 mM each)	12 µl
• MgCl2 (22.5 mM)	36 µl
• RT Enzyme Mix 2*1	36 µl
• Exonuclease I (5 U/µl)	72 µL
• TdT Buffer (5×)	144 µl
• dATP (90 mM)	24 µl
• TdT Enzyme Mix*2	54 µl
• PCR Primer Mix 2	300 µl
• RNase Free dH_2O	1 ml

***1: Contains PrimeScript Reverse Transcriptase and RNase Inhibitor**
***2: Contains Terminal Deoxynucleotidyl Transferase (TDT) and RNase H**



cDNA amplification from single cells
Reagent: SYBR® *Premix Ex Taq™ II* (Perfect Real Time)
Note: this product has been replaced with SYBR *Premix Ex Taq™ II* (Tli RNase H Plus)
Target: Human B2M , RPLP2 , GAPDH
Instrument: Thermal Cycler Dice Real Time



Real-time PCR analysis: expression level correlates with starting cell number.
Reagent: SYBR® *Premix Ex Taq™ II* (Perfect Real Time)
Note: this product has been replaced with SYBR *Premix Ex Taq™ II* (Tli RNase H Plus)
Target: Mouse Gapdh , Ywhaz , or Tfrc
Instrument: Thermal Cycler Dice Real Time

Product Information

Cat.No	Product	Size
3732	CellAmp™ Direct RNA Prep Kit for RT-PCR (Real Time)	200 Rxns
3733	CellAmp™ RT-PCR for Direct Prep Kit (Real Time) & Protein Analysis	200 Rxns
3734	CellAmp™ Whole Transcriptome Amplification Kit (Real Time), Ver. 2	100 Rxns

Kits for qPCR analysis and detection

Transgene Detection Primer Set for Real Time (Mouse)

Features

- **Allows EGFP/AcGFP and LacZ transgenes detection in mouse genome:** 2 primers pairs for each genes are included
- **Allows quantification of the copy number of transgenes inserted:** 2 reference genes primer pairs included for relative quantification
- Direct qPCR and genotyping is possible with the Terra™ qPCR Direct SYBR® Premix

Kit Components

3788

• GFP Primer-1 (2 µM ea.)[1]	500 µl
• GFP Primer-2 (2 µM ea.)[2]	500 µl
• lacZ Primer-1 (2 µM ea.)[3]	500 µl
• lacZ Primer-2 (2 µM ea.)[3]	500 µl
• Reference Primer-1 (2 µM ea.)[4]	500 µl
• Reference Primer-2 (2 µM ea.)[5]	500 µl

1 GFP Primer-1 is designed for consensus sequence common to both EGFP and AcGFP1
2 GFP Primer-2 is designed for EGFP. It is not used for AcGFP1 detection
3 lacZ primer -1 and -2 are designed for lacZ (β-galactosidase) gene and positioned at different sites
4 Reference Primer-1 is for a region of Ywhaz gene on mouse chromosome 15
5 Reference Primer-2 is for a region of Raver2 gene on mouse chromosome 4

Synthetic siRNA Quantitation Core Kit

Features

- Detects siRNA in Total RNA with SYBR® Green I Real Time PCR
- Excellent for Low Copy Number siRNAs
- For siRNA quantitation from total RNA samples extracted from cells, tissues, blood, ..., in silencing experiments

Kit Components

6142[1]

• Terminal Transferase Buffer	390 µl
• Terminal Transferase	30 µl
• dATP	150 µl
• Recombinant RNase Inhibitor	30 µl
• Oligo dT Primer[2]	150 µl
• RT Buffer	270 µl
• RT Enzyme Mix	30 µl
• Universal Primer (10 µM)	120 µl
• EASY Dilution (for Real Time PCR)	1 ml
• Control siRNA (20 nM)	10 µl
• Control Primer (10 µM)	20 µl

1 Contains enough reagents for 30 reactions of poly dA tailing and reverse transcription and enough Universal Primer for 120 real time PCRs
2 Specially designed Oligo dT Primer for this product

Notes:
This kit is designed to quantify synthetic siRNA with deoxythymidines d(TT) as a 3' overhang. For synthetic siRNA with 3' overhangs other than d(TT), prepare a specific oligo dT primer with a modified sequence.
This product does not work with synthetic siRNAs that lack 3' overhangs.

Product Information

Cat.No	Product	Size
3788	Transgene Detection Primer Set for Real Time (Mouse)	100 Rxns
6142	Synthetic siRNA Quantitation Core Kit	30 Rxns

Primer Arrays series

Features

- **Simultaneous screening of 88 types of pathway related genes:** using the difference in gene expression level
- **Best performance with SYBR® *Premix Ex Taq™* II** (TIi RNase H): no optimization necessary
- **Easy analysis:** with a tool exclusive for use with PrimerArray™ products
- **Affordable:** a primer array allows analysis of 12 RNA samples
- Several control genes for normalization

Kit Components

Each primer array (Human or Mouse) consists of a 96 well plates with primers pairs specific to the pathway of interest.
Enough primers are included for 12 qPCR on 96 well plates.

Visit our PrimerArray page online for details on target genes: www.clontech.com

Product Information

Cat.No	Product	Size
	Human PrimerArrays	
PH001	PrimerArray® Cytokine-cytokine receptor interaction (Human)	1 Set
PH002	PrimerArray® Cell cycle (Human)	1 Set
PH003	PrimerArray® Cell adhesion molecules (Human)	1 Set
PH004	PrimerArray® Jak-STAT signaling pathway (Human)	1 Set
PH005	PrimerArray® Natural killer cell mediated cytotoxicity (Human)	1 Set
PH006	PrimerArray® Axon guidance (Human)	1 Set
PH007	PrimerArray® Focal adhesion (Human)	1 Set
PH008	PrimerArray® T cell receptor signaling pathway (Human)	1 Set
PH009	PrimerArray® TGF-beta signaling pathway (Human)	1 Set
PH010	PrimerArray® Wnt signaling pathway (Human)	1 Set
PH011	PrimerArray® Colorectal Cancer & Pancreatic Cancer (Human)	1 Set
PH012	PrimerArray® Prostate Cancer & Melanoma (Human)	1 Set
PH013	PrimerArray® Small Cell Lung Cancer & Non-small Lung Cancer (Human)	1 Set
PH014	PrimerArray® Asthma & Rheumatoid Arthritis (Human)	1 Set
PH015	PrimerArray® Diabetes Mellitus, Type I & Type II (Human)	1 Set
PH016	PrimerArray® Embryonic Stem Cells (Human)	1 Set
PH017	PrimerArray® Hepatic Differentiation (Human)	1 Set
	Mouse PrimerArrays	
PN001	PrimerArray® Cytokine-cytokine receptor interaction (Mouse)	1 Set
PN002	PrimerArray® Cell cycle (Mouse)	1 Set
PN003	PrimerArray® Cell adhesion molecules (Mouse)	1 Set
PN004	PrimerArray® Jak-STAT signaling pathway (Mouse)	1 Set
PN005	PrimerArray® Natural killer cell mediated cytotoxicity (Mouse)	1 Set
PN006	PrimerArray® Axon guidance (Mouse)	1 Set
PN007	PrimerArray® Focal adhesion (Mouse)	1 Set
PN008	PrimerArray® T cell receptor signaling pathway (Mouse)	1 Set
PN009	PrimerArray® TGF-beta signaling pathway (Mouse)	1 Set
PN010	PrimerArray® Wnt signaling pathway (Mouse)	1 Set
PN011	PrimerArray® Colorectal Cancer & Pancreatic Cancer (Mouse)	1 Set
PN012	PrimerArray® Prostate Cancer & Melanoma (Mouse)	1 Set
PN013	PrimerArray® Small Cell Lung Cancer & Non-small Lung Cancer (Mouse)	1 Set
PN014	PrimerArray® Asthma & Rheumatoid Arthritis (Mouse)	1 Set
PN015	PrimerArray® Diabetes Mellitus, Type I & Type II (Mouse)	1 Set
PN016	PrimerArray® Embryonic Stem Cells (Mouse)	1 Set

Reverse Transcription

PrimeScript™ RTase

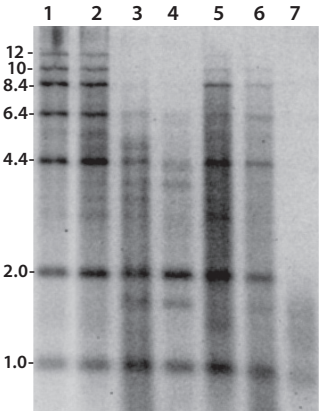
Features

- **MMLV RNase H minus RTase with strong extension activity:** capable of extending up to 12kb templates with minimal background
- **High strand displacement activity:** cDNA synthesis and extension through complex RNA structure at 42°C
- **High specificity:** Reduced mispriming increases reverse transcription efficiency
- **High accuracy reverse transcription**

Kit Components

2680A

• PrimeScript™ Reverse Transcriptase	10,000 U
• 5X PrimeScript™ Buffer	500 µl



A comparison of PrimeScript™ RTase and six competitor RTases in first-strand cDNA synthesis

1: PrimeScript™ 200 U
2: Company A
3: Company B
4: Company C
5: Company D
6: Company E
7: Company F

Lane 1 contains the PrimeScript™ reaction, Lanes 2-6 were tested using the manufactures' recommended protocols. PrimeScript™ shows excellent cDNA yield, high sensitivity and low background compared to other enzymes.

PrimeScript™ 1st Strand cDNA Synthesis Kit

Features

- **Excellent elongation:** able to synthesize long cDNAs (up to 12 kb) with good yield
- **Robust and efficient:** carries out reverse transcription at standard RT temperature (42°C), even when RNA template contains high-order structures
- **Oligo dT and random primers included:** use of poly A and total RNA templates

Kit Components

6110A

• PrimeScript™ RTase 200 U/µl	50 µl
• 5X PrimeScript™ Buffer	200 µl
• RNase Inhibitor 40 U/µl	25 µl
• dNTP Mixture 10 mM each	50 µl
• Oligo dT Primer 50 µM	50 µl
• Random 6 mers 50 µM	100 µl
• RNase free dH_2O	1 ml

PrimeScript™ II 1st Strand cDNA Synthesis Kit

Features

- **Improved specificity with accessory protein:** increases RT efficiency by avoiding mispriming
- **Excellent elongation:** able to synthesize full length cDNAs with good yield
- **Robust and efficient:** carries out reverse transcription at standard RT temperature (42° C), even when RNA template contains high-order structures
- **Oligo dT and random primers included:** use of poly A and total RNA templates

Kit Components

6210A

• PrimeScript™ II RTase 200 U/µl	50 µl
• 5X PrimeScript™ Buffer	200 µl
• RNase Inhibitor 40 U/µl	25 µl
• dNTP Mixture 10 mM each	50 µl
• Oligo dT Primer 50 µM	50 µl
• Random 6 mers 50 µM	100 µl
• RNase free dH_2O	1 ml

Reverse Transcription (continued)

RNA to cDNA EcoDry Premix

Features

- **Lyophilized premix including RTase, dNTP, buffer and primers:** just add RNA template in water
- **Ultrapure SMART MMLV RTase:** synthesis of high-quality first-strand cDNA of up to 11.7 kb, from virtually any transcript
- **Eco-friendly format:** RT storage and shipping
- **Supplied in 8 PCR tube strips:** unprecedented flexibility and ease-of-use

Kit Components

3, 6 or 12 x 8-tube strips RNA to cDNA EcoDry Premix (including either Random Hexamers, Oligo dT or both primers)

3, 6 or 12 Optically Clear PCR Cap Strips (8 caps/strip)

PrimeScript™ Double Strand cDNA Synthesis Kit

Features

- **Includes the high efficiency enzyme PrimeScript Reverse Transcriptase** to synthesize first strand cDNA from purified polyA+ RNA
- **The resulting double-stranded cDNA** can be cloned into an appropriate vector to generate a cDNA library
- **Contains a positive control RNA:** double-stranded cDNA synthesized from the positive control RNA template and cloned results in a plasmid that confers tetracycline resistance

Kit Components

6111A

• PrimeScript RTase (200 U/µl)	10 µl
• RNase Inhibitor (40 U/µl)	10 µl
• Oligo(dT)18 Primer (1 µg/µl)	20 µl
• Random Primer (9 mer) (0.3 µg/µl)	20 µl
• 5X 1st Strand Synthesis Buffer	40 µl
• dNTP Mixture (10 mM each)	40 µl
• E. coli RNase H/E. coli DNA Ligase Mixture	20 µl
• E. coli DNA Polymerase I (20 U/µl)	20 µl
• 5X 2nd Strand Synthesis Buffer	300 µl
• T4 DNA Polymerase (1 U/µl)	40 µl
• RNase free dH_2O	2 x 600 µl
• Control RNA (1 µg/µl)*	5 µl

*The Control RNA is a 1.4-kb polyA+ RNA from the tetracycline resistance gene that can be used as a positive control. When full-length double-stranded cDNA is synthesized from this RNA template and cloned, the resulting plasmid confers tetracycline resistance.

Product Information

Cat.No	Product	Size
2680A/B	PrimeScript™ RTase (200 U/µl)	10 000/4x10 000 U
6110A/B	PrimeScript™ 1st Strand cDNA Synthesis Kit	50/4x50 Rxns (20 µl)
6210A/B	PrimeScript™ II 1st Strand cDNA Synthesis Kit	50/4x50 Rxns (20 µl)
6111A	PrimeScript™ Double Strand cDNA Synthesis Kit	10 Rxns
639549	RNA to cDNA EcoDry™ Premix (Double Primed)	24 Rxns
639547	RNA to cDNA EcoDry™ Premix (Double Primed)	48 Rxns
639548	RNA to cDNA EcoDry™ Premix (Double Primed)	96 Rxns
639543	RNA to cDNA EcoDry™ Premix (Oligo dT)	24 Rxns
639541	RNA to cDNA EcoDry™ Premix (Oligo dT)	48 Rxns
639542	RNA to cDNA EcoDry™ Premix (Oligo dT)	96 Rxns
639546	RNA to cDNA EcoDry™ Premix (Random Hexamers)	24 Rxns
639544	RNA to cDNA EcoDry™ Premix (Random Hexamers)	48 Rxns
639545	RNA to cDNA EcoDry™ Premix (Random Hexamers)	96 Rxns

RT-PCR kits – Two-Step

PrimeScript™ RT-PCR Kit

Features

- **Complete elongation:** PrimeScript™ RTase works efficiently on higher structured RNA templates
- **High yield of full-length cDNA:** PrimeScript™ RTase offers high yield transcription of full length cDNAs of up to 12 kb
- **High specificity, efficient elongation:** RT-PCR kits combining PrimeScript™ RTase and *TaKaRa Ex Taq®* HS minimize false priming and allow robust amplification from fragments of varying sizes
- **Two-step RT-PCR kit:** greater efficiency and possibility to perform multiple PCR on same cDNA template

Kit Components

RR014A*

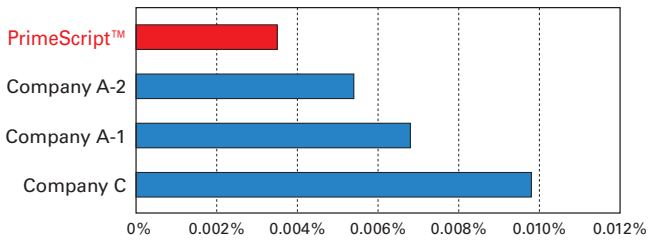
• PrimeScript™ RTase (for 2-step)	25 µl
• 5X PrimeScript™ Buffer	200 µl
• RNase Inhibitor 40 U/µl	25 µl
• dNTP Mixture 10 mM each	150 µl
• Oligo dT Primer 2.5 µM	50 µl
• Random 6 mers 20 µM	50 µl
• *TaKaRa Ex Taq™* HS 5 U/µl	25 µl
• 10X PCR Buffer II	250 µl
• Control F-1 Primer** 20 µM	10 µl
• Control R-1 Primer*** 20 µM	10 µl
• Positive Control RNA $2x10^5$ copies/µl	20 µl
• RNase Free dH_2O	1 ml

*** 50 reactions of [Reverse transcription 20 µl & PCR 50 µl]**
**** Upstream sense primer for Positive Control RNA**
***** Downstream anti-sense primer for Positive Control RNA**

PrimeScript™ High Fidelity RT-PCR Kit

Features

- **Include PrimeSTAR Max polymerase:** highest fidelity of any commercially available PCR enzyme
- Efficient yield of RT-PCR amplification products while maintaining high fidelity
- **Excellent extension,** even with template RNAs likely to assume higher-order structures at the standard temperature for reverse transcription (42°C)
- **Broad tolerance for the amount of total RNA:** robust and easy to use kit



RTase	Bases sequenced	Error(bases)	Error rate(%)
PrimeScript™	201,297	7	0.0035
Company A-2	166,227	9	0.0054
Company A-1	161,409	11	0.0068
Company C	132,962	13	0.0098

Kit Components

R022A*

• PrimeScript RTase (for 2 step)	25 µl
• 5X PrimeScript Buffer	200 µl
• RNase Inhibitor (40 U / µl)	25 µl
• 5 × PrimeScript Buffer	200 µl
• dNTP Mixture (10 mM each)	50 µl
• Oligo dT Primer (2.5 µM)	50 µl
• Random 6 mers (20 µM)	50 µl
• PrimeSTAR Max Premix (2X)	2 x 625 µl
• Control F-1 Primer**(20 µM)	10 µl
• R-Control Primer 1*** (20 µM)	10 µl
• Control RNA positive (2×10^5 copies / µl)	20 µl
• RNase Free dH_2O	1 ml

*** For 50 reactions of 2-step RT-PCRs (20 µl RT reaction volume & 50 µl PCR volume)**
****: Upstream sense primer for the Positive Control RNA**
*****: Downstream antisense primer for the Positive Control RNA**

RT-PCR kits – One-Step

PrimeScript™ One-Step RT-PCR Kit Ver. 2

Features

- **Easily test several samples:** One-Step kit allows repeated tests consistently
- **Robust and efficient:** PrimeScript™ One-Step Enzyme Mix with *TaKaRa Ex Taq®* HS featuring specific and sensitive amplification
- **Convenient premix type:** amenable to high throughput
- **Version with loading dye:** directly load product on gel

Kit Components

RR055A

• PrimeScript™ One-Step Enzyme Mix	100 µl
• 2X One-Step Buffer	2 x 625 µl
• Control F-1 Primer* 20 µM	20 µl
• Control R-1 Primer** 20 µM	20 µl
• Positive Control RNA (2x10^5 copies/µl)	20 µl
• RNase Free dH_2O	2 x 625 µl

RR057A

• PrimeScript™ One-Step Enzyme Mix	100 µl
• 2X One-Step Buffer (Dye Plus)	2 × 625 µl
• Control F-1 Primer* (20 µM)	20 µl
• Control R-1 Primer** (20 µM)	20 µl
• Positive Control RNA (2x10^5 copies/µl)	20 µl
• RNase Free dH_2O	2 x 625 µl

*** Upstream sense primer for Positive Control RNA**
**** Downstream anti-sense primer for Positive Control RNA**

Product Information

Cat.No	Product	Size
RR014A/B	PrimeScript™ RT-PCR Kit	50/4x50 Rxns (50 µl)
R022A/B	PrimeScript™ High Fidelity RT-PCR Kit	50/4x50 Rxns (50 µl)
RR055A/B	PrimeScript™ One Step RT-PCR Kit Ver.2	50/4x50 Rxns (50 µl)
RR057A/B	PrimeScript™ One Step RT-PCR Kit Ver.2 (Dye Plus)	50/4x50 Rxns (50 µl)

For commercial use or molecular diagnostic services and kits

Titanium *Taq* SP and PrimeSTAR GXL SP

Titanium Taq SP and PrimeSTAR GXL SP are specially formulated for OEM/bulk or diagnostic use (GPR registered in USA). Commercial Use of these SP enzymes may provide cost-savings on royalty and license fees in some situations. If you are interested in Commercial Use of our products, including OEM, please contact Business Development at BD_OEM@clontech.com to discuss your needs.

	Titanium *Taq* SP DNA Polymerase	PrimeSTAR GXL SP DNA Polymerase
General characteristics	• Sensitive and robust performance	• Excellent all-around performance on a variety of templates
Applications	• Multiplex PCR • Whole-genome PCR • SNP assays • Genotyping (including mammalian samples) • Primer extension • Rare template amplification • Preparative PCR Specially formulated for commercial and OEM use Appropriate for use in general laboratory applications, including molecular diagnostic development and testing	• Amplification prior to NGS • Long PCR • Sequencing • Cloning • PCR with GC-rich, AT-rich, or repetitive sequences • Amplification of rare alleles • PCR with limiting sample amounts
Amplicon size		
gDNA	<2 kb	<30 kb
Plasmid/lambda	<2 kb	<40 kb
cDNA	<4 kb	<13.5 kb
Enzyme properties		
3'– 5' exonuclease activity		✓
T/A overhangs or blunt ends	T/A	Blunt
Fidelity (sequencing)		6.5X Taq (GC-rich target)
Speed		10 sec/kb (rapid protocol)
GC - rich targets		Up to 73%
Hot start	✓	✓

PrimeSTAR® series: [Superheroes' high-fidelity PCR]

PrimeSTAR Max DNA Polymerase

Features

- **Novel polymerase with high proofreading activity:** highest fidelity of any commercially available PCR polymerase
- **Unique elongation factor for ultra-fast extension speed:** 5sec./kb means less time required for PCR cycles
- **Convenient premix:** assemble reactions in less time and get optimal results
- **Antibody-mediated hot-start formulation:** room temperature assembly and specific amplification
- **Proven performance** as reported in peer-reviewed literature

Kit Components

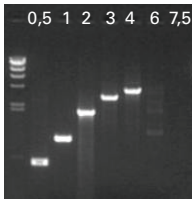
R045A

• PrimeSTAR® Max Premix (2X)*	4 x 625 µl

*** Mg^{2+} concentration: 2 mM (2X)**

Amplify 4kb in just 10 seconds elongation time with PrimeSTAR Max

PrimeSTAR Max

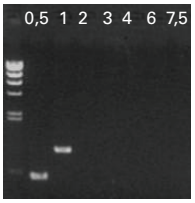


Template: Human genomic DNA
Extension time: 10 seconds

PrimeSTAR Max can amplify human genomic DNA up to 6kb in length in 30 seconds.

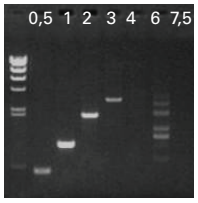
98°C	10sec	} 30cycles
55°C	5sec	
72°C	10sec	

Company F



98°C	30sec	
98°C	10sec	} 30cycles
55°C	20sec	
72°C	10sec	
72°C	10min	

Company A



95°C	2min	
95°C	20sec	} 30cycles
55°C	20sec	
72°C	10sec	
72°C	3min	

PrimeSTAR GXL DNA Polymerase

Features

- **Modified PrimeSTAR® polymerase combined with elongation factor:** unsurpassed processivity with high accuracy
- **Longest amplification:** up to 30 kb with human gDNA or 13.5 kb with cDNA
- **Robust enzyme buffer combination:** outstanding performance on GC-rich or AT-rich templates and targets containing repeats
- **Can be used with samples containing excess nucleic acid:** tolerates a wide range of template quantity, including high levels of template that inhibit other high-fidelity DNA polymerases
- **Antibody-mediated hot-start formulation:** room temperature
assembly and specific amplification
- **Proven performance** as reported in peer-reviewed literature

Kit Components

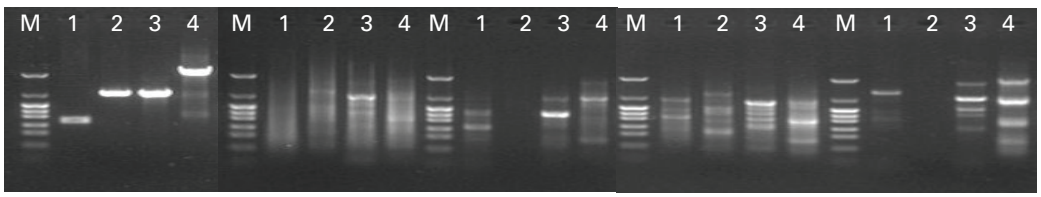
R050A

• PrimeSTAR® GXL DNA Polymerase (1.25 U/µl)	200 µl
• 5X PrimeSTAR® GXL Buffer (Mg^{2+} plus)*	2 x1 ml
• dNTP Mixture (2.5 mM each)	800 µl

*** Mg^{2+} concentration: 5 mM (5X)**

Best amplification of high GC content DNA with PrimeSTAR GXL

PrimeSTAR GXL Company M Company A Company I Company F



Good yield and specific products were obtained using PrimeSTAR® GXL DNA Polymerase.

Lane 1, 2: Template: Human genomic DNA (100 ng / 50 µl reaction) 1. APOE gene 746 bp (GC content 74%) 2. TGF β 1 gene 2005 bp (GC content 69%)

Lane 3, 4: Template: *T. thermophilus* HB8 genomic DNA (10 ng / 50 µl reaction)
3. 2029 bp (GC content 74%)
4. 4988 bp (GC content 74%)

PrimeSTAR® series (continued)

PrimeSTAR® HS DNA Polymerase

Features

- **Superior accuracy:** a strong 3′ exonuclease activity results in an extremely low error rate, with only 15 of 484,000 bp containing errors as determined by DNA sequence analysis
- **Excellent efficiency:** novel polymerase selected for its amplification efficiency - even higher than *Taq* Polymerase
- **Robust amplification:** tolerance to varying reaction conditions means a single PCR cycling protocol can be used to amplify products of varying sizes
- **Antibody-mediated hot-start formulation:** room temperature assembly and specific amplification
- **PrimeSTAR® HS with GC Buffer:** optimized buffer for accurate PCR of GC-rich templates
- **Premix version available:** convenient and easy to use in high throughput setup

Kit Components

R010A

• PrimeSTAR® HS DNA polymerase	100 µl
• 5X PrimeSTAR® Buffer (Mg^{2+})	2 x 1 ml
• dNTP Mixture	800 µl

R040A

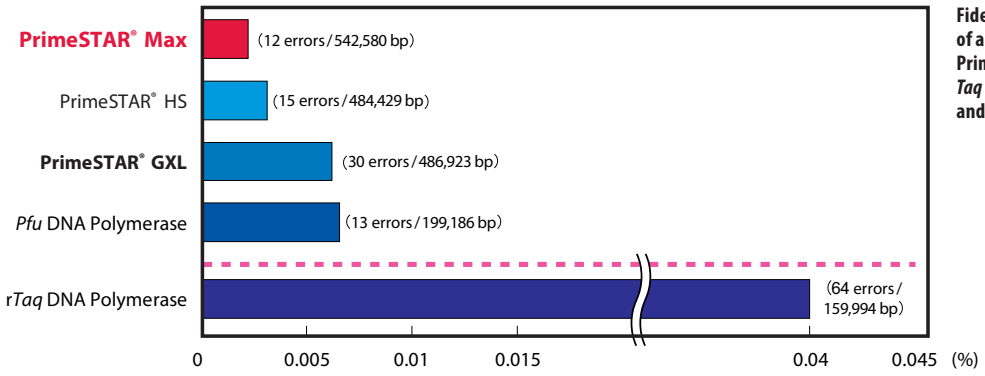
• PrimeSTAR® HS Premix (2X)*	5 x 500 µl

*** Contains PrimeSTAR® HS DNA Polymerase, 1.25 units/25 µl; dNTP Mixture: 2X conc.; ea. 0.4 mM; PrimeSTAR® Buffer: 2X conc.; including 2mM Mg^{2+}.**

R044A

• PrimeSTAR® HS DNA Polymerase	100 µl
• 2X PrimeSTAR® GC Buffer (Mg^{2+})*	1.7 ml
• dNTP Mixture (2.5 mM each)	800 µl

*** Mg^{2+} concentration: 2 mM (2X)**



Fidelity comparison of all three PrimeSTAR enzymes, *Taq* polymerase and *Pfu* polymerase.

Product Information

Cat.No	Product	Size
R045A/B	PrimeSTAR® MAX DNA Polymerase	100/4x100 Rxns (50 µl)
R050A/B	PrimeSTAR® GXL DNA Polymerase	250/4x250 Units
R010A/B	PrimeSTAR® HS DNA Polymerase	250/4x250 Units
R040A	PrimeSTAR® HS DNA Polymerase (premix)	100 Rxns (50 µl)
R044A/B	PrimeSTAR® HS DNA Polymerase with GC Buffer	250/4x250 Units

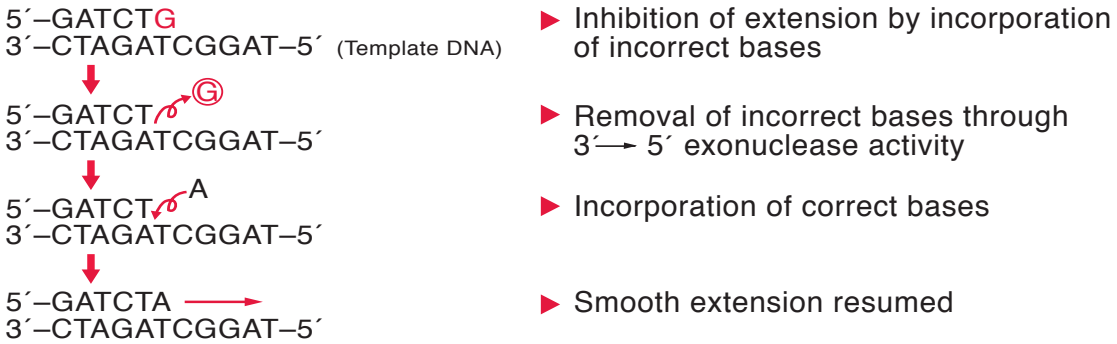
Introduction to Takara Bio's LA PCR Technology

Using *Taq* DNA Polymerase has several limitations. It does not possess "proofreading" activity (3′ → 5′ exonuclease activity), and therefore has a relatively high rate of base misincorporation (error rate). At the end of a typical 30-cycle PCR reaction, a significant proportion of the products generated with *Taq* Polymerase contain one or more errors. Because *Taq* DNA Polymerase tends to "fall off" DNA templates at sites of these misincorporations, both product yield and length are impacted.

Long and Accurate PCR (LA PCR) technology provides a solution to the problems intrinsic to the use of conventional *Taq* Polymerase. LA PCR technology involves combining *Taq* DNA Polymerase with a small amount of a proofreading polymerase, producing an enzyme mix with performance characteristics (fidelity, yield, length, reproducibility) superior to either enzyme alone.

Takara Bio provides the largest available selection of high-performance PCR reagents and kits based on LA PCR technology.

- ***TaKaRa Ex Taq®* DNA Polymerase** offers high sensitivity, increased product yield and length, and improved fidelity over *Taq* Polymerase.
- ***TaKaRa LA Taq®* DNA Polymerase** is optimized for long range PCR and can synthesize products up to 48 kb in length with fidelity 6.5X better than Taq Polymerase, and requires less optimization than other long PCR polymerases.
- ***TaKaRa LA Taq®* DNA Polymerase with GC Buffer** is optimized for amplification of GC-rich templates.
- **SpeedSTAR™ HS DNA Polymerase** is optimized for high speed PCR and provides reaction speeds up to 5X faster than *Taq*.
- Hot start versions of ***Ex Taq* DNA Polymerase** and ***LA Taq* DNA Polymerase** are available, and these powerful enzymes are also incorporated in qPCR, RT-PCR, RACE, cloning, mutagenesis, and screening kits.



Principle of LA PCR Technology.

The key to LA PCR technology is the enzyme mix. Both Takara *Ex Taq®* and Takara *LA Taq®* are thermostable DNA polymerases which possess 3′-5′ exonuclease, or proofreading activity. This 3′-5′ exonuclease activity removes misincorporated bases, allowing subsequent product extension to proceed smoothly and efficiently, making amplification of long DNA fragments possible.

High yield PCR

TaKaRa Ex Taq® DNA Polymerase

Features

- **Blend of *Taq* polymerase and proofreading enzyme:** efficient amplification with improved fidelity
- **Sensitivity and efficiency:** start with less DNA template and make more product than *Taq*
- **Reliability and reproducibility:** tolerant to variations in template quality and quantity
- **Efficient with difficult templates:** ideal for all routine PCR
- **Robust enzyme / buffer combination:** minimal optimization required
- **Proven records for a variety of DNA origin:** enzyme of choice for plant, ancient or unusual DNA
- **Wide length range:** make both small (<100 bp) and large (up to 20 kb) products
- **2X Premix version:** easy assembly and reduced contamination risk. Amenable to high throughput

Kit Components

RR001A

• *TaKaRa Ex Taq*® (5 U/µl)*	250 U
• 10X *Ex Taq™* Buffer (contains 20 mM $MgCl_2$)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

RR01AM

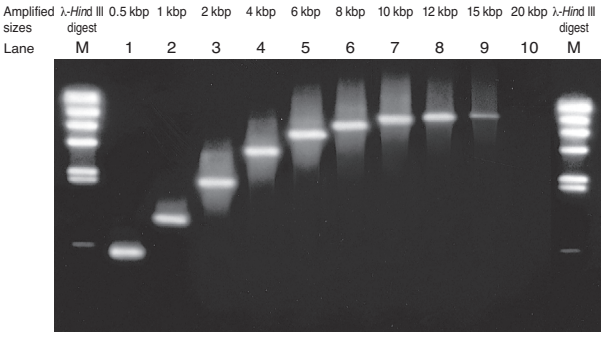
• *TaKaRa Ex Taq*® (5 U/µl)*	250 U
• 10X *Ex Taq™* Buffer (without $MgCl_2$)	1 ml
• 25 mM $MgCl_2$	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

RR003A

• *Premix Taq™* (*Ex Taq™* Version)	6 x 500 µl

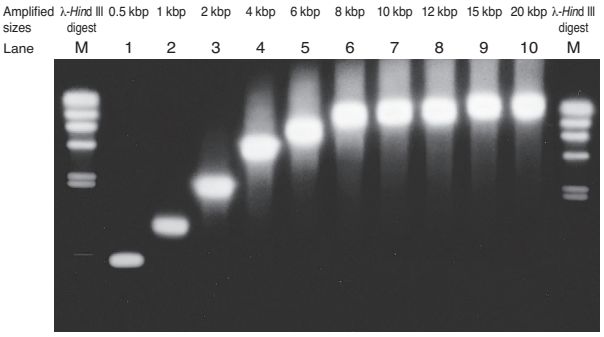
*** Protocol recommends the use of 1.25 U per 50 µl reaction.**
****Contains *Ex Taq™* DNA Polymerase, *Ex Taq™* Buffer, Mg^{2+} and dNTPs.**

TaKaRa Taq™



Applied volume: 5 µl

TaKaRa Ex Taq™



Applied volume: 5 µl

Template: λDNA 2.5 ng
Conditions of thermal cycling:
Lane 1-6: 94°C, 30 sec.
55°C, 1 min. } 30 cycles
72°C, 5 min.
Lane 7-10: 94°C, 30 sec.
55°C, 1 min. } 30 cycles
72°C, 15 min.

Comparison between *TaKaRa Ex Taq™* and *TaKaRa Taq™* for PCR efficiency and length

High yield PCR (continued)

TaKaRa Ex Taq® Hot-Start Version

Features

- **Antibody mediated hot start:** immediate activation avoids long heating and preserves *Ex Taq™* efficiency
- **Increased specificity:** reduces primer-dimer and unspecific amplification resulting in reduced background
- **Superior results on difficult templates:** more sensitive detection
- **Facilitates high throughput amplifications:** room temperature assembly and possible multiplexing
- **Premix version available:** reduces pipeting, contamination risks and adds convenience

Kit Components

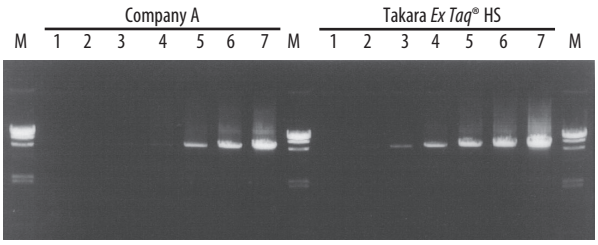
RR006A

• *TaKaRa Ex Taq*® HS (5 U/µl)	250 U
• 10X *Ex Taq™* Buffer (contains 20 mM $MgCl_2$)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

RR030A

• *Premix Ex Taq™* Hot Start Version (2X)*	5 x 500 µl

*** Contains *TaKaRa Ex Taq*® HS, 1.25 units/25 µl; dNTP Mixture, 2X conc.; ea 0.4 mM ExTaq™ Buffer, 2X conc.; including 4 nM Mg^{2+}.**



Amplification efficiency comparison between Takara's *Ex Taq*™ HS DNA Polymerase and high-grade Hot Start PCR Enzyme from company A.
A 7.5 kb*

Product Information

Cat.No	Product	Size
RR001A/B/C	*TaKaRa Ex Taq*® DNA Polymerase	250/4x250/12x250 Units
RR01AM/BM/CM	*TaKaRa Ex Taq*® DNA Polymerase (Mg^{2+} free buffer)	250/4x250/12x250 Units
RR003A	*Premix Taq*™ DNA Polymerase (*Ex Taq*™ Version 2.0)	120 Rxns (50 µl)
RR006A/B	*TaKaRa Ex Taq*® DNA Polymerase Hot-Start Version	250/4x250 Units
RR030A	*Premix Ex Taq*™ DNA Polymerase Hot Start Version	100 Rxns (50 µl)
9002A/B	*Taq* Antibody	250/4x250 Units

High yield PCR (continued)

EmeraldAmp® Max PCR Master Mix

Features

- **High yield:** 10X more end product than *Taq* and can amplify targets up to 10 kb
- **Robust performance:** optimized buffer for better performance on GC-rich or AT-rich targets
- **Convenient:** just add template, primers and water to 2X Master Mix
- **Emerald green loading dye included in premix:** load PCR reaction directly onto a gel and track migration during electrophoresis
- **Eliminate purification steps:** use for TA cloning or direct sequencing without purification
- **Restriction enzyme digestion:** digest PCR products directly in the PCR buffer

Kit Components

RR320A

• EmeraldAmp® Max PCR Master Mix (2X)*	4 x 1 ml
• dH_2O	4 x 1 ml

*** Includes high yield polymerase, dNTPs, optimized buffer and loading dye 2X conc.**

EmeraldAmp® Max HS PCR Master Mix

Features

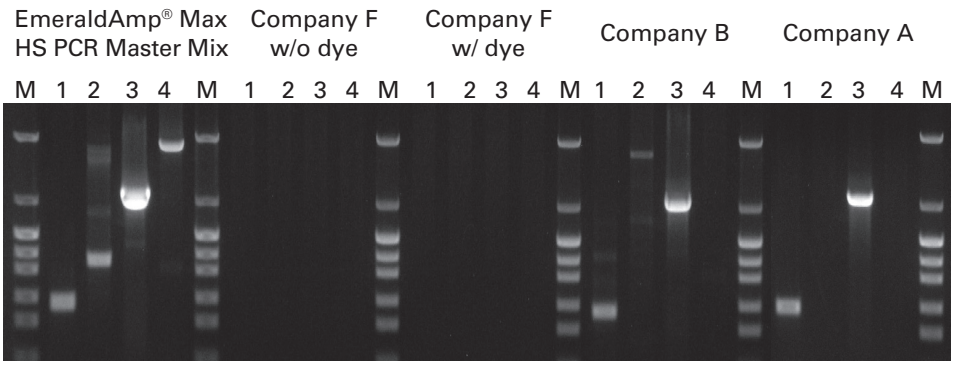
- **Antibody mediated hot start:** immediate activation avoids long heating and preserves same performance as EmeraldAmp® Max PCR Master Mix
- **Increased specificity:** reduces primer-dimer and unspecific amplification resulting in reduced background
- **Superior results on difficult templates:** more sensitive detection
- **Facilitates high throughput amplifications:** room temperature assembly and possible multiplexing

Kit Components

RR330A

• EmeraldAmp® Max HS PCR Master Mix (2X)*	4 x 1 ml
• dH_2O	4 x 1 ml

*** Includes high yield polymerase, dNTPs, optimized buffer and loading dye 2X conc.**



Template: Human Genomic DNA

Target:
1. BCL2 581bp (GC 67.7%)
2. IGFB-1 987bp (GC 72.3%)
3. jun 2025bp (GC 65.2%)
4. IGF2R 3890bp (GC 63.1%)

Template Amount: 50 ng
Reaction Size: 25 µl

Comparison of EmeraldAmp® Max HS with competitors for GC-rich targets. Takara's EmeraldAmp® Max HS PCR Master Mix was tested against Company A's, Company B's and Company F's dye-added premixes, as well as Company F's premix without dye. EmeraldAmp® Max HS PCR Master Mix showed the best reaction efficiency (with significantly higher yields compared to the other premixes) and was the only premix able to amplify the 3890 bp fragment.

Product Information

Cat.No	Product	Size
RR320A/B	EmeraldAmp® MAX PCR Master Mix	160/5x160 Rxns (50 µl)
RR330A/B	EmeraldAmp® MAX HS PCR Master Mix	160/5x160 Rxns (50 µl)

High yield and multiplex PCR

Titanium *Taq* DNA Polymerase & PCR Kits

Features

- **High Yield PCR:** amplify your target using fewer PCR cycles while reducing background
- **Tolerant to a wide range of magnesium concentrations:** perform PCR without optimizing particularly in multiplex settings
- **Sensitive amplification:** amplify rare targets
- **Integrated Hot Start with TaqStart Antibody:** higher specificity especially useful for multiplex PCR
- **Available in various formats:** with an optimized buffer, in a complete PCR kit with dNTPs and PCR controls, or in lyophilized premix format (see page p.42)

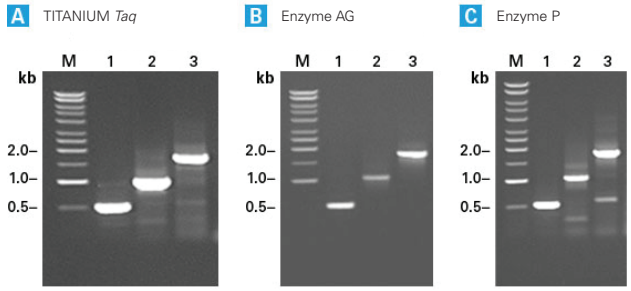
Kit Components

639208

• 50X TITANIUM™ *Taq* DNA Polymerase	100 µl
• 10X TITANIUM™ *Taq* PCR Buffer	600 µl

639210

• 50X Titanium *Taq* DNA Polymerase	100 µl
• 10X Titanium *Taq* PCR Buffer	600 µl
• 50X dNTP Mix (10 mM each)	120 µl
• Control DNA Template (100 ng/µl)	100 µl
• Control Primer Mix (10 µM each)	100 µl
• PCR-Grade Water	4 x 1.25 ml



Titanium *Taq* efficiently amplifies specific genes from genomic DNA.
Human cardiac beta-myosin heavy chain fragments of different lengths were amplified from 100 ng of genomic DNA using Titanium Taq and two leading competitor's hot start Taq polymerases. Optimal conditions were used for each enzyme, as specified by the manufacturer. Lane 1: 0.5 kb fragment. Lane 2: 1 kb fragment. Lane 3: 1.8 kb fragment. Lane M: 1 kb DNA size ladder.

Product Information

Cat.No	Product	Size
639208	Titanium®*Taq* DNA Polymerase	100 Rxns
639209	Titanium®*Taq* DNA Polymerase	500 Rxns
639242	Titanium®*Taq* DNA Polymerase	1 000 Rxns
639210	Titanium®*Taq* PCR Kit	100 Rxns
639211	Titanium®*Taq* PCR Kit	30 Rxns
639292*	Titanium®*Taq* SP DNA Polymerase	100 Rxns

NOTE* General Purpose Reagent. This product is intended For Laboratory Use. Outside of the United States, this product is intended for research use only unless otherwise stated. This product is not intended for a specific application or made for any clinical use. The performance characteristics of this product have not been fully established. It is the user's responsibility to validate the performance of the product, and any component thereof, for any particular use. Resale or transfer of this product, any component thereof, or any substance produced through use of this product, or any component thereof, to any third party is expressly forbidden. To obtain additional rights, please contact BD_OEM@clontech.com.

cDNA Library Construction & RACE PCR

Advantage 2 Polymerase Mixes & PCR Kits

Features

- **Unique blend of enzymes:** almost 3-fold higher fidelity than wild-type Taq
- **Based on Titanium Taq:** Exceptionally high yields and sensitivity
- **Pre-optimized buffer:** No need to optimize reaction conditions
- **High Fidelity PCR:** Perfect for RACE PCR, cDNA amplification, library construction, and PCR Subtraction
- **Available in various formats:** with an optimized buffer, in a complete PCR kit with dNTPs and PCR controls, or in lyophilized premix format (see page p.42)

Kit Components

639201

• 50X Advantage 2 Polymerase Mix	100 µl
• 10X Advantage 2 PCR Buffer	600 µl
• 10X Advantage 2 SA PCR Buffer	600 µl

639206

• 50X Advantage 2 Polymerase Mix	100 µl
• 10X Advantage 2 PCR Buffer	600 µl
• 10X Advantage 2 SA PCR Buffer	600 µl
• 50X dNTP Mix (10 mM each)	120 µl
• Control DNA Template (100 ng/µl)	100 µl
• Control Primer Mix (10 µM each)	100 µl
• PCR-Grade Water	4 x 1.25 ml

GC-Rich PCR Amplification

Advantage GC 2 Polymerase Mixes & PCR Kits

Features

- **Unique blend of enzymes:** almost 3-fold higher fidelity than wild-type Taq
- **Based on Titanium Taq:** Exceptionally high yields and sensitivity
- **Includes proprietary GC-Melt Reagent:** for use with complex, GC-rich cDNA and gDNA templates
- **High Fidelity PCR:** Virtually error-free PCR products
- **Long PCR:** Amplifies targets of up to 6 kb

Kit Components

639114

• 50X Advantage-GC 2 Polymerase Mix	100 µl
• 5X GC 2 PCR Buffer	2 x 600 µl
• GC-Melt	2 x 1 ml

639119

• 50X Advantage-GC 2 Polymerase Mix	100 µl
• 5X GC 2 PCR Buffer	600 µl
• GC-Melt	2 x 1.0 ml
• 50X dNTP Mix (10 mM each)	120 µl
• Control DNA Template (100 attomoles/µl)	30 µl
• Control Primer Mix (10 µM each)	40 µl
• PCR-Grade Water	3 x 1.25 ml

Product Information

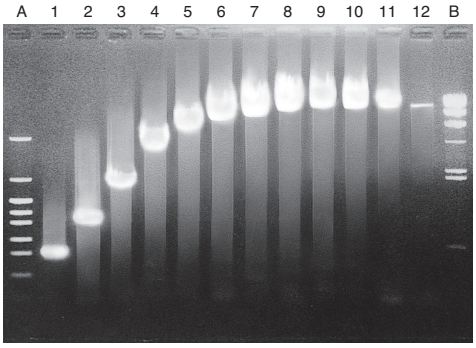
Cat.No	Product	Size
639137	10X Advantage® 2 PCR Buffer	2 x 600 uL
639138	10X Advantage® 2 PCR Buffer	10 mL
639148	10X Advantage® 2 SA PCR Buffer	10 mL
639206	Advantage® 2 PCR Kit	100 Rxns
639207	Advantage® 2 PCR Kit	30 Rxns
639201	Advantage® 2 Polymerase Mix	100 Rxns
639202	Advantage® 2 Polymerase Mix	5 x 100 Rxns
639119	Advantage® GC 2 PCR Kit	100 Rxns
639120	Advantage® GC 2 PCR Kit	10 Rxns
639114	Advantage® GC 2 Polymerase Mix	100 Rxns

Long PCR

TaKaRa LA Taq® DNA Polymerase

Features

- **Blend of *Taq* and proofreading polymerases:** increased yield, length and fidelity of PCR
- **Long amplifications:** up to 30 kb for human genomic and complex template DNA or 48 kb for λDNA
- **Improved fidelity:** 6.5X better than *Taq*
- **Excellent yield:** large quantities of desired target and greater sensitivity
- **Antibody mediated hot start version:** improved specificity allows better amplification of long target



Amplification of DNA fragments from 0.5-35 kb in size (different primer sets) using *LA Taq*™

LA Taq™ DNA Polymerase was used to amplify the various fragments and generated high product yields, even with very long (28 kb) fragments.

Kit Components

RR002M

• *TaKaRa LA Taq®* (5 U/µl)*	250 U
• 10X LA PCR Buffer II (contains 25 mM $MgCl_2$)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

RR002A

• *TaKaRa LA Taq®* (5 U/µl)*	125 U
• 10X LA PCR Buffer II (without Mg^{2+})	1 ml
• 25 mM $MgCl_2$	1 ml
• dNTP Mixture (2.5 mM each dNTP)	400 µl

RR042A

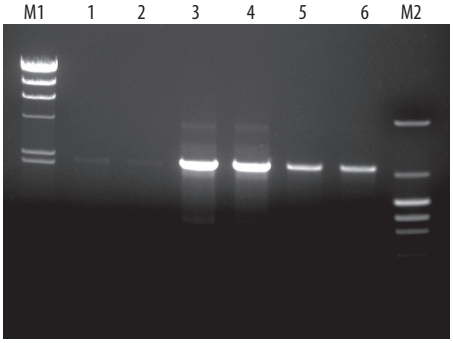
• *TaKaRa LA Taq®* (5 U/µl)*	125 U
• 10X *LA Taq™* Buffer (Mg^{2+} Free)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	400 µl

*** Protocol recommends the use of 2.5 U per 50 µl reaction.**

TaKaRa LA Taq® with GC Buffers

Features

- **GC Buffers I & II:** for successful amplification of High GC and secondary structures
- **Better results on difficult templates**



M1.: λ-*Hin*d III digest
1 & 2: *LA Taq*™ / LA PCR Buffer II
3 & 4: *LA Taq*™ with GC Buffer/ GC Buffer I
5 & 6: *LA Taq*™ with GC Buffer/ GC Buffer II
M2: pHY Marker

Comparison of Amplification Efficiency between *LA Taq*™ with GC Buffer and *LA Taq*™ using a GC-rich Target Fragment. A 2.1 kb mouse rRNA gene with 63.4% GC was amplified from 1 ng of mouse genomic DNA The results show *LA Taq*™ with GC Buffer gave optimal results in amplification of the 2.1 kb fragment with both excellent yields and high specificity.

Kit Components

RR02AG

• *TaKaRa LA Taq®* (5 U/µl)*	125 U
• 2X GC Buffer I (contains 5 mM $MgCl_2$)	1.25 ml
• 2X GC Buffer II (contains 5 mM $MgCl_2$)	1.25 ml
• dNTP Mixture (2.5 mM each dNTP)	400 µl

*** Protocol recommends the use of 2.5 U per 50 µl reaction.**

Long PCR (continued)

LA PCR Kit, Version 2.1

Features

- **Contains all reagents required:** for optimizing and verifying long PCR
- **Contains both standard and GC Buffers:** For difficult long templates and high GC-content

Kit Components

RR013A

• *TaKaRa LA Taq*® (5 U/µl)	125 U
• 10X LA PCR Buffer II (contains 25 mM Mg^{2+})	250 µl
• 10X LA PCR Buffer II (without Mg^{2+})	250 µl
• $MgCl_2$ (25 mM)	500 µl
• dNTP Mixture (2.5 mM each dNTP)	400 µl
• Control Template (100 ng/µl HT29 DNA)	10 µl
• Control Primer LA3 (10 pmol/µl)*	10 µl
• Control Primer LA4 (10 pmol/µl)*	10 µl
• λ-Hind III MW Markers (100 ng/µl)	20 µl
• 2X GC Buffer I (contains 5 mM $MgCl_2$)	1.25 ml
• 2X GC Buffer II (contains 5 mM $MgCl_2$)	1.25 ml
• Control Primer GC1 (10 pmol/µl)**	10 µl
• Control Primer GC2 (10 pmol/µl)**	10 µl

*** Amplifies a 17.5 kb region of the Control Template.**
****Amplifies a 1,255 bp GC-rich region of the Control Template.**

Product Information

Cat.No	Product	Size
RR002A	*TaKaRa LA Taq*® DNA Polymerase (Mg^{2+} free buffer)	125 Units
RR002M/B/C	*TaKaRa LA Taq*® DNA Polymerase (Mg^{2+} plus buffer)	250/4x250/12x250 Units
RR02AG	*TaKaRa LA Taq*® DNA Polymerase with GC Buffer	125 Units
RR013A/B	LA PCR Kit, Version 2.1	50/2x50 Rxns (50µl)
RR042A/B	*TaKaRa LA Taq*® DNA Polymerase Hot-Start Version	125/4x125 Units

High Speed PCR

SpeedSTAR™ HS DNA Polymerase

Features

- **High speed amplification:** amplify a 2 kb fragment in as little as 30 minutes
- **Excellent efficiency:** robust performance, comparable to high yield polymerases
- **No special instrument needed:** cut reaction times by two-thirds without purchasing a specialized instrument
- **Long fragments:** optimized two-buffer system allows amplification of fragments up to 20 kb with reduced optimization
- **Hot Start polymerase:** room temperature reaction assembly

Kit Components

RR070A

• SpeedSTAR™ HS DNA polymerase (5 U/µl)	250 U
• 10X Fast Buffer I (Mg^{2+})*	1 ml
• 10X Fast Buffer II (Mg^{2+})*	1 ml
• dNTP Mixture (ea. 2.5 mM)	800 µl

*** Mg^{2+} Concentration: 10X Fast Buffer I, 30mM; 10X Fast Buffer II, 20mM.**

SapphireAmp® Fast PCR Master Mix

Features

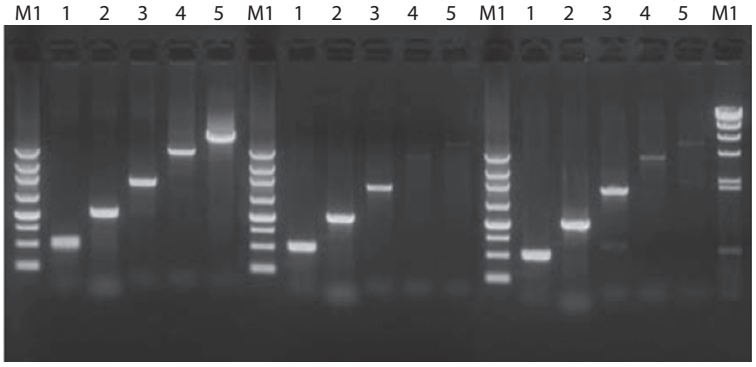
- **Convenient 2X premix with dye for fast PCR:** eliminates pipeting steps and contamination risks
- **Antibody mediated hot start polymerase:** immediate activation and room temperature reaction assembly
- **10 seconds/kb extension speed:** reactions completed in less than 1/2 the time of conventional *Taq*
- **LA Technology based enzyme:** high yield and sensitive PCR
- **R.E. digestion can be directly performed on PCR products:** no purification or precipitation needed
- **PCR Reaction can be directly loaded onto a gel:** no additional pipeting at the end of the PCR
- **Amenable to robotic handling:** high throughput PCR ready; Ideal for high content PCR screening like colony PCR

Kit Components

RR350A

• SapphireAmp® Fast PCR Master Mix (2X)	4 x 1 ml
• dH_2O	4 x 1 ml

Takara SapphireAmp® Fast | Company A Hot Start Master Mix | Company B Hot Start Dye Mix



Template: Human Genome 100ng/50µl

Targets:

1: p53	0.5 kb (54%)
2: FFAR2	1.0 kb (59%)
3: DCLRE1A	2.0 kb (38%)
4: p53	4.2 kb (48%)
5: IGF2R	5.9 kb (50%)

Sapphire Amp® Cycle Count

Lane: 1-3 (0.5 - 2.0 kb)
94°C 1min.
↓
98°C 5 sec.
55°C 5 sec.
72°C 10 sec./kb
— 30 Cycles

Sapphire Amp® Cycle Count

Lane: 4, 5 (4.2 , 5.9 kb)
94°C 1min.
↓
98°C 5 sec.
68°C 30 sec./kb
— 30 Cycles

Company A and B
Recommended protocol
1 min/kb

Refer to PrimeSTAR® Max for ultimate fast and accurate enzyme *(page 27)*

Product Information

Cat.No	Product	Size
RR070A/B	SpeedSTAR™ HS DNA Polymerase	250/4x250 Units
RR350A/B	SapphireAmp® Fast PCR Master Mix	160/5x160 Rxns (50µl)

Terra Direct Polymerase and kits

Terra™ PCR Direct Polymerase Mix & Red Dye Premix

Features

- **Novel polymerase tolerant to PCR inhibitors:** amplify directly from animal or plant tissues or blood samples
- **Skip sample preparation:** save time and money on purification kits
- **Robust enzyme:** readily amplifies GC-rich targets
- **Automatic hot start:** room-temperature set-up
- **Red Dye Premix includes a gel-loading dye:** added convenience with same performance

Kit Components

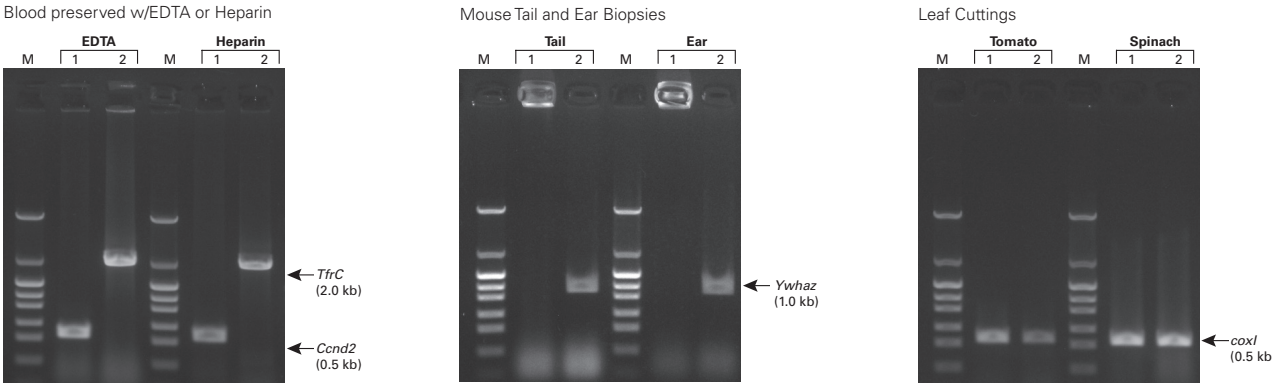
639270

• Terra™ PCR Direct Polymerase Mix (1.25 U/µl)	200 µl
• 2X Terra™ PCR Direct Buffer (incl. Mg^{2+}, dNTP)	5 x 1 ml

639286

• Terra™ PCR Direct Red Dye Premix (2X)	5 x 1 ml
• dH_2O	5 x 1 ml

Terra PCR has been optimized to allow direct amplification from a variety of tissues:



Panel A. Terra PCR Direct was used to amplify the cyclin D2 gene (*Ccnd2*, 0.5 kb; Lane 1) and the transferrin receptor gene (*TfrC*, 2 kb; Lane 2) from 1 µl of mouse blood treated with either EDTA or heparin. Panel B. Terra PCR Direct was used to amplify the mouse *Ywhaz1* gene (1 kb) directly from either a 1 mm tail or 1.5 mm2 ear biopsy. A 4 µl aliquot of each sample was mixed with gel loading buffer that either lacked or contained proteinase K (Lanes 1 and 2, respectively). The PCR products treated with proteinase K ran as expected, whereas those without proteinase K treatment got stuck in the wells. Panel C. Terra PCR Direct was used to amplify the cytochrome c oxidase gene (*cox1*; 0.5 kb) directly from 0.5 mm (Lane 1) and 1.2 mm (Lane 2) tomato or spinach leaf cuttings (made using hole punches).

Terra™ PCR Direct Genotyping Kit

Features

- **All reagents included for direct genotyping:** fast and easy PCR up to 2 kb on animal tissue
- **Special loading dye:** better agarose resolution of PCR product

Kit Components

639285

• Terra™ PCR Direct Polymerase Mix (1.25 U/µl)	200 µl
• 2X Terra™ PCR Direct Buffer-For Genotyping*	4 x 1.25 ml
• Terra™ PCR Direct - Tissue Extraction Buffer	5 ml
• Proteinase K (20 mg/ml)	100 µl
• 5X Loading Dye - For Genotyping	3 x 1 ml

*** Includes Mg^{2+} and dNTP**

Terra™ PCR Direct FFPE Kit

Features

- **All reagents included to amplify directly from FFPE DNA extract:** no deparaffinization step
- **Includes Terra direct DNA polymerase:** sensitive amplification up to 2 kb even with inhibitors

Kit Components

639284

• Terra™ PCR Direct Polymerase Mix (1.25 U/µl)	200 µl
• 2X Terra™ PCR Direct Buffer - For FFPE Samples*	5 x 1 ml
• Terra™ PCR Direct – DNA recovery Buffer	5 x 4 ml
• Proteinase K (20 mg/ml)	2 x 100 µl

*** Includes Mg^{2+} and dNTP**

Terra™ PCR Direct Card Kit

Features

- **All reagents for direct amplification of DNA on FTA® card:** use with blood, buccal swabs, plant leaves, ...
- **Includes Terra direct DNA polymerase:** sensitive amplification up to 2 kb without extensive purification; just place a piece of card in the PCR mix

Kit Components

639287

• Terra™ PCR Direct Polymerase Mix (1.25 U/µl)	200 µl
• 2X Terra™ PCR Direct Buffer - For Cards*	5 x 1 ml

*** Includes Mg^{2+} and dNTP**

Product Information

Cat.No	Product	Size
639287	Terra™ PCR Direct Card Kit	200 Rxns (50µl)
639284	Terra™ PCR Direct FFPE Kit	200 Rxns (50µl)
639285	Terra™ PCR Direct Genotyping Kit	200 Rxns (50µl)
639269	Terra™ PCR Direct Polymerase Mix	40 Rxns (50µl)
639270	Terra™ PCR Direct Polymerase Mix	200 Rxns (50µl)
639271	Terra™ PCR Direct Polymerase Mix	800 Rxns (50µl)
639286	Terra™ PCR Direct Red Dye Premix	200 Rxn (50µl)

TaKaRa Taq® DNA polymerase

TaKaRa Taq® and *Premix Taq™* (*TaKaRa Taq®* Version)

Features

- **Highly purified recombinant *Taq*:** low DNA grade enzyme (< 10 fg E. coli DNA/ 1.25U)
- **Reliable and reproducible:** Consistent lot-to-lot results
- **dNTP mixture included:** guaranteed PCR performance up to 3kb

Kit Components

R001A

• *TaKaRa Taq®* (5 U/µl)*	250 U
• 10X PCR Buffer (contains 15 mM $MgCl_2$)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

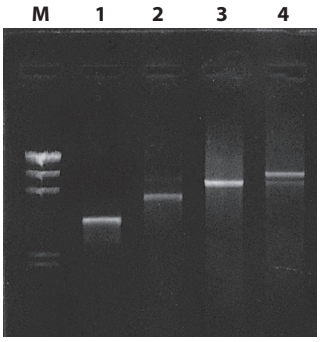
R001AM

• *TaKaRa Taq®* (5 U/µl)*	250 U
• 10X PCR Buffer (without Mg^{2+})	1 ml
• 25 mM $MgCl_2$	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

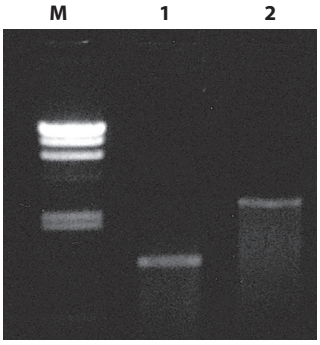
R004A

• 2X *Taq* Polymerase Premix**	6 x 500 µl

*** Protocol recommends the use of 1.25 U per 50 µl reaction.**
**** Contains *TaKaRa Taq®*, PCR Buffer and dNTPs.**



Amplification of λDNA.
A sample containing 1 ng of λDNA was amplified with *TaKaRa Taq®*, using various sets of primers. The PCR products were analyzed by agarose gel electrophoresis: lane 1, 4 kb; lane 2, 6 kb; lane 3, 8 kb; lane 4, 10 kb; lane M, λ-Hind III DNA marker.

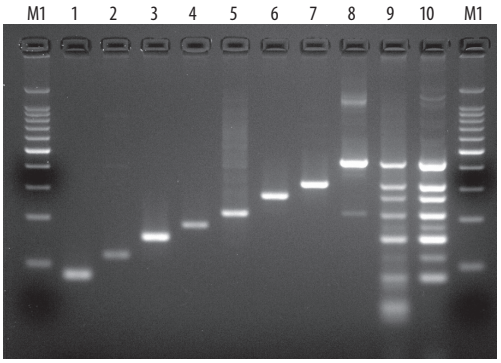


Amplification of a Single-Copy Gene.
Amplification was performed using *TaKaRa Taq®*, human placental genomic DNA (100 ng a template, and primers that amplified two different regions of the human p53 gene. The size of amplified products were 1.2 kb (lane 1) and 2.9 (lane 2). Lane M contains λ-Hind III DNA marker.

TaKaRa Taq® HS and *Premix Taq™* HS

Features

- **Antibody mediated hot start:** immediate activation preserves optimal efficiency
- **Automatic hot start:** convenient room-temperature assembly
- **Improved specificity:** allows multiplexing



Comparison of *TaKaRa Taq®* and *TaKaRa Taq®* HS in Multiplex PCR experiment

Kit Components

R007A

• *TaKaRa Taq®* HS DNA Polymerase (5 U/µl)*	250 U
• 10X PCR Buffer (contains 15 mM $MgCl_2$)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	800 µl

*** Protocol recommends the use of 1.25 U per 50 µl reaction.**

R028A

• *TaKaRa Taq®* HS DNA Polymerase, Premix (2X)*	5 x 500 µl

*** Contains dNTP Mixture ea. 0.4 mM; *TaKaRa Taq®* HS (1.25U/25µl) and PCR buffer (20 mM Tris-HCl, pH8.3, 100 mM KCl, 3 mM $MgCl_2$)**

Amplification of various human genomic DNA fragments using a standard *Taq* DNA Polymerase and *TaKaRa Taq®* Hot-Start DNA Polymerase.
PCR reactions were performed using human genomic DNA as a template and 8 different primer pairs for each single fragment. All fragments are amplified in a multiplex reaction, Lane 9, amplified using Standard *Taq*. Lane 10, amplified using *TaKaRa Taq®* Hot-Start.

TaKaRa Taq® HS Perfect Mix

Features

- **Routine PCR** with modified *Takara Taq*
- **Fast PCR enzyme 20s/kb elongation:** requires half time of regular PCR
- **Automatic Ab mediated Hot Start**
- **2x Premix for convenience**

Kit Components

R300A

• *TaKaRa Taq*® HS Perfect Mix	5 x 500 µl

Product Information

Cat.No	Product	Size
R001A/B/C	*TaKaRa Taq*® DNA Polymerase	250/4x250/12x250 Units
R001AM/BM/CM	*TaKaRa Taq*® DNA Polymerase (with Mg^{2+} free buffer)	250/4x250/12x250 Units
R004A	*Premix Taq*™ DNA Polymerase (*TaKaRa Taq*® Version 2.0)	120 Rxns (50 µl)
R007A/B	*TaKaRa Taq*® DNA Polymerase Hot Start Version	250/4x250 Units
R028A	*Premix Taq*™ DNA Polymerase Hot-Start Version	100 Rxns (50 µl)
R300A/B	*TaKaRa Taq*® HS Perfect Mix	100/4x100 Rxns (50 µl)

Dye added premix for routine PCR

EmeraldAmp® GT PCR Master Mix

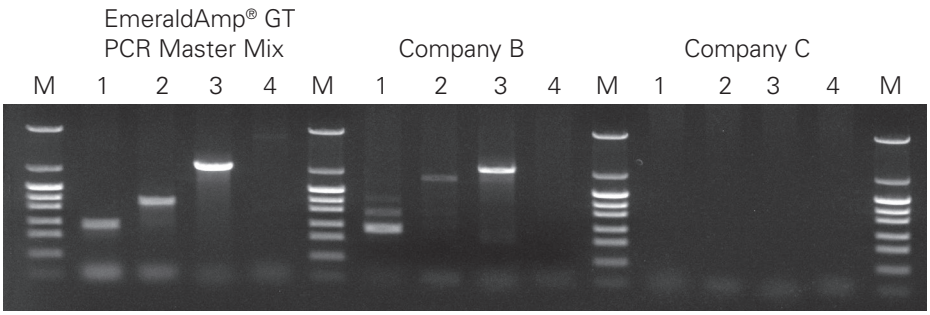
Features

- **Improved performance:** optimized buffer for better performance on GC- or AT- rich targets
- **Convenient:** just add template, primers and water to the 2X Master Mix
- **Eliminate purification steps:** use PCR product for TA cloning or sequencing without purification
- **Emerald Green loading dye:** load the PCR reaction directly onto a gel; blue + yellow dyes allow tracking during electrophoresis
- **Restriction enzyme digestion:** digest PCR products directly in the PCR buffer
- **Low contamination grade *Taq*:** <10 fg of E. coli DNA/1.25 units of *Taq*

Kit Components

RR310A

• EmeraldAmp® GT PCR Master Mix (2X)	4 x 1 ml
• dH_2O	4 x 1 ml



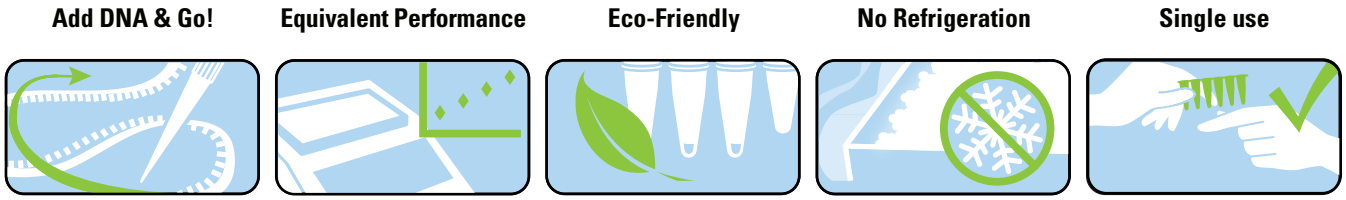
Template: human genomic DNA
target:
1. BCL2 581bp (GC 67.7%)
2. IGFB-1 987bp (GC 72.3%)
3. jun 2025bp (GC 65.2%)
4. IGF2R 3890bp (GC 63.1%)

Comparison of EmeraldAmp GT with competitors for GC-rich targets. Takara's EmeraldAmp® GT PCR Master Mix was tested against company B's and company C's dye-added premixes. EmeraldAmp® GT PCR Master Mix provided greater reaction efficiency than company B's and C's dye-added premixes with GC-rich human DNA templates. Takara's EmeraldAmp® GT PCR Master Mix provided excellent yield with GC-rich DNA fragments up to 2025 bp.

Product Information

Cat.No	Product	Size
RR310A/B	EmeraldAmp® GT PCR Master Mix	160/5x160 Rxns (50 µl)

Lyophilized Premixes for PCR



Lyophilized PCR Premixes are packaged in 8-well tube strips with clear sealing caps.

Lyophilized HS *Taq* PCR Master Mix

Features

- **Lyophilized master mix:** just add PCR grade water with template and primers
- **Dispensed in PCR tubes:** avoids contamination or pipetting errors
- **RT storage:** no freezer space needed
- ***TaKaRa Taq® HS included*:** specific and reproducible PCR results up to 3 kb

Kit Components

RR058A

• Lyophilized HS *Taq* PCR Master Mix*	3 x 8-tube strip
• Optically Clear PCR Cap Strips	3 x 8-cap strip

*** For 25µl PCR, includes LA Technology based *Taq* HS DNA polymerase, $MgCl_2$, dNTPs and PCR buffer in a lyophilized form.**

EcoDry PCR Premixes

Features

- **Eco-friendly format:** room temperature storage and shipping means less waste and energy
- **Lyophilized mastermix for convenience:** just add PCR grade water with template and primers
- **8 tubes strip format for flexibility and ease-of-use:** avoids contamination or pipetting errors
- **High yield version with Titanium *Taq*:** specific and sensitive PCR in limiting condition (i.e. single copy target)
- **High fidelity version with Advantage 2 polymerase:** Enzyme blend of Titanium and proofreader delivers improved fidelity and generates longer amplification (i.e. with cDNA template)

Kit Components

639282

• High Fidelity PCR EcoDry Premix*	3 x 8-tube strip
• Optically Clear PCR Cap Strips	3 x 8-caps strip

*** For 25µl PCR, includes Advantage 2 DNA Polymerase Mix (with a hot start antibody and a proofreading enzyme); $MgCl_2$ (2 mM final conc.); dNTP Mix; Reaction Buffer; Cryoprotectant and Stabilizers**

639278

• High Yield PCR EcoDry Premix*	3 x 8-tube strip
• Optically Clear PCR Cap Strips	3 x 8-caps strip

*** For 25µl PCR, includes TITANIUM™ *Taq* DNA Polymerase Mix (with a hot start antibody); $MgCl_2$ (2 mM final conc.); dNTP Mix; Reaction Buffer; Cryoprotectant and Stabilizers**

Product Information

Cat.No	Product	Size
RR058A	Lyophilized HS *Taq* PCR Master Mix	24 Rxns (25µl)
639278	High Yield PCR EcoDry™ Premix	24 Rxns (25µl)
639276	High Yield PCR EcoDry™ Premix	48 Rxns (25µl)
639282	High Fidelity PCR EcoDry™ Premix	24 Rxns (25µl)
639280	High Fidelity PCR EcoDry™ Premix	48 Rxns (25µl)

DNA methylation analysis by PCR

TaKaRa EpiTaq™ HS (for bisulfite-treated DNA)

Features

- **High efficiency:** excellent performance on bisulfite-treated DNA templates containing uracil for amplification of methylated regions (CpG islands)
- **Extended product length:** amplification of amplicons up to 1,000 bp
- **High specificity:** antibody-mediated hot-start prevents non-specific amplification and primer-dimer formation
- **Easy:** amplified PCR-products are ready for TA cloning

Kit Components

R110A

• EpiTaq™ HS (5 U/µl)	250 U
• 10X EpiTaq™ PCR Buffer (Mg^{2+} free)	1 ml
• dNTP Mixture (2.5 mM each dNTP)	1.2 ml
• 25 mM $MgCl_2$	1.2 ml

TaKaRa EpiTaq™ HS is a PCR enzyme used to search the methylation of CpG islands in target DNA.

Primers are designed in unmethylated regions flanking the CpG sites. They are composed of 3 kinds of bases (TGA or ACT), and tend to be T- or A-rich, because all unmethylated Cs are converted to Us. This poor variety of primers can cause PCR failure. Use of an optimized enzyme/buffer system is necessary.

EpiScope® MSP Kit (Methylation Specific PCR)

Features

- **Specific:** optimized enzyme and buffer system for methylation specific PCR (MSP) with discriminating primers
- **High performance:** highly efficient PCR amplification from bisulfite-treated DNA templates containing uracil
- **Robust:** differentiate methylated/unmethylated DNA by analyzing a single CpG site
- **Versatile:** perform both real-time and endpoint PCR using the same PCR conditions

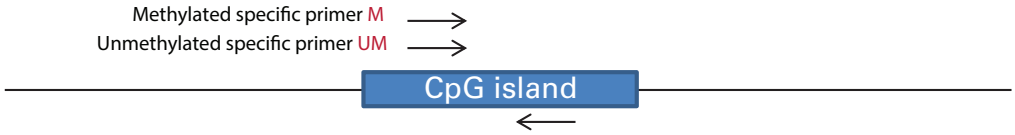
Kit Components

R100A

• 2X MSP Buffer (with Mg^{2+} and dNTPs)*	5 x 1 ml
• MSP Enzyme	240 µl
• 100X SYBR Green I	100 µl
• ROX Reference Dye (50X conc.)	200 µl
• ROX Reference Dye II (50X conc.)	200 µl

*** The Mg^{2+} concentration (2X) is 4 mM and the dNTP concentration (2X) is 400 µM.**

EpiScope® MSP Kit is specifically designed for Methylation Specific PCR, which distinguishes between a methylated and an unmethylated sequence.



Primers are designed on CpG sites to distinguish between converted U and unconverted C (methylated), after bisulfite treatment. Sequences of M and UM primer are almost the same except for the methylated bases.

Product Information

Cat.No	Product	Size
R110A/B	TaKaRa EpiTaq™ HS (for bisulfite-treated DNA)	250/4x250 Units
R100A/B	EpiScope® MSP Kit	200/2x200 Rxns (50 µl)
3520	EpiScope™ Methylated HeLa gDNA	15 µg
3521	EpiScope® Unmethylated HCT116 DKO gDNA	10 µg
3522	EpiScope® Methylated HCT116 gDNA	10 µg

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